Assessing and Counseling the Older Driver: A Concise Review for the Generalist Clinician

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Abstract

Older drivers are putting more miles on the road during their “golden years” than generations prior. Many older adults have safe driving habits, but unique age-related changes increase the risk for crash-related morbidity and mortality. Generalists are poised to assess and guide older adults’ driving fitness. Although there is no uniformly accepted tool for driving fitness, assessment of 5 key domains (cognition, vision, physical function, medical comorbidities, and medications) using valid tools can help clinicians stratify older drivers into low, intermediate, and high risk for unsafe driving. Clinicians can then make recommendations about fitness to drive and appropriate referrals for rehabilitation or alternative transportation resources to optimize mobility, independence, and quality of life for older adults.
You receive a call from your patient’s daughter, who is concerned about her father’s driving safety. Your patient is a 76-year-old retired professor with coronary artery disease, depression, sleep apnea, and subjective memory concerns. His medications include aspirin, atorvastatin, sertraline, and clonazepam. He has no history of motor vehicle collisions and has not gotten lost driving. His daughter reports “close calls” while driving with her father. His Mini-Mental State Examination (MMSE) score in the office is 26/30, losing points for delayed recall (2), copied figure (1), and counting backward by serial sevens (1). He has reduced neck rotation, with normal results on the remainder of the musculoskeletal and neurologic examinations, including good visual acuity and no obvious visual field deficits. How will you assess this patient’s driving capacity?

Older drivers comprise 19% of licensed drivers in the United States.1 Although drivers over the age of 65 are more likely to respect speed limits, wear seatbelts, and avoid alcohol while driving,1,2 this cohort is disproportionally represented in motor vehicle collision fatalities. Drivers older than 75 years experience fatal accidents at rates higher than all other drivers over age 29.1 This disparity is in part related to heightened physical vulnerability to injury but also to increased likelihood of comorbid conditions that impact driving safety. Conversely, driving cessation is associated in observational studies with considerable morbidity, including social isolation, depression,3 need for long-term care,4 and mortality.5

The increasing proportion of automobile drivers over the age of 65 creates a clinical imperative for clinicians to develop and hone office-based assessment skills to identify at-risk drivers. Through longitudinal relationships, generalists may observe changes in their patients’ health and function and provide iterative guidance. At this time, a “one size fits all” driving assessment tool does not exist. The American Geriatrics Society (AGS) and National Highway Traffic Safety Administration have developed a comprehensive approach to older driver assessment.1 This concise review offers a practical framework for busy clinicians to assess and counsel older drivers.

**KEY CLINICAL DOMAINS: COGNITION, VISION, PHYSICAL FUNCTION, COMORBID CONDITIONS, AND MEDICATIONS**

**Cognition**

Multiple intact cognitive capacities are essential for safe driving. These factors include complex attention, visuospatial skills, working memory, executive function, judgment, and insight into one’s own driving abilities. Much of our understanding of the role of cognition in safe driving comes from literature addressing the impact of declining cognitive faculties (seen with conditions such as dementia and mild cognitive impairment) on measures of driving performance. Although it is not possible to recognize the instant an individual loses safe driving capacity, it is important for the clinician to assess and recognize cognitive surrogates of unsafe driving.

A 2017 meta-analysis of a subgroup of 240 drivers with varying stages of dementia and 151 healthy controls revealed that drivers with even very mild to mild dementia (Clinical Dementia Rating [CDR] score, 0.5-1) were 10 times more likely to fail on an on-road performance test (relative risk, 10.77).6 Yet, as of 2006, about 30% of adults with dementia were on the road.7

Individuals with dementia spectrum conditions represent a heterogeneous group. Many with mild cognitive impairment or early dementia with minimal functional impairment may be able to safely operate a motor vehicle. In its practice parameter, the American Academy of Neurology uses functional status, as measured by the CDR, to gauge cognitive capacity for driving. For instance, adults with severe dementia (CDR score, 2) are generally identified as high risk for unsafe driving and should be counseled to stop driving immediately.8 The CDR-2 characteristics include difficulty retaining new material, difficulty with time relationships, and impairment in problem-solving skills.
solving. However, an adult with moderate forgetfulness and some difficulties with community activities and complex home tasks (CDR score, 0.5-1) may require more systematic assessment before making recommendations on driving. Importantly, in early dementia, driving skills progressively decline over time, necessitating frequent reassessment of essential cognitive capacities for driving (eg, every 6 months).5

Because the CDR requires specialized training and approximately 30 minutes to administer and interpret, additional tools may be more practical for the generalist clinician to identify those in need of further driving assessment. The AGS/National Highway Traffic Safety Administration framework suggests the Montreal Cognitive Assessment, clock drawing test, Trail Making Test, and maze test for assessing cognition, with poor performance reported as correlating with poor simulator performance, failure of on-road driving tests, and crash rates.10-13 These tests engage the patient’s attention, memory, visuospatial skills, and executive function, a set of interacting skills necessary for safe driving.7 The Table lists these tests and cutoff scores indicating increased unsafe driving risk. Depending on the clinical scenario, these tests can be utilized independently or in concert. A combination of multiple tests may be more predictive than a single test alone. It is important to note that the Montreal Cognitive Assessment includes an abbreviated version of a trail making test and a clock drawing test, making it a useful single tool. Both Parts A and B of the Trail Making Test require patients to demonstrate visual searching, attention, and motor speed; the Trail Making Test Part B additionally requires the patient to switch their attention between numbers and letters. Because of the complex relationship between cognitive capacities, overlearned physical activities, and risk-taking behavior, an individualized approach to score interpretation, rather than use of precise cutoffs, is needed. Specifically, normal scores on testing do not ensure safe driving capacity. The holistic clinical assessment must be accounted for when making recommendations for cognitive driving fitness.7

In addition to poorer performance on cognitive screening tools, cognitively impaired drivers may lack insight into their driving fitness, inaccurately gauge their abilities, and fail to curtail their driving accordingly. Care partner observations and input about their loved one’s driving performance may be useful.8

After a careful cognitive assessment, if the patient’s retained functional cognitive capacity remains difficult to describe, clinicians should partner with a local driving rehabilitation specialist in a process described subsequently.

**Vision**

Driving is a visually demanding task. Specific visual deficits, such as reductions in visual acuity, visual field impairment, and contrast sensitivity are associated with common conditions (eg, glaucoma, cataracts, macular degeneration) and correlate with crashes or unsafe driving.10 Visual acuity and/or visual field testing is performed at many state licensing agencies in the United States. Studies have found reduction in crashes and crash fatalities for states requiring in-person renewals, particularly among the oldest drivers (age 85 years and older), and some state-based studies have suggested that visual acuity screening at the time of in-person license renewal may reduce crash rates among the elderly.15,16 Acuity and visual field requirements vary slightly by state, with visual acuity of 20/40 needed for an unrestricted license in most states. Basic visual acuity should be assessed in the office with a Snellen chart, with acuity of less than 20/40 prompting referral to an eye specialist. One composite visual skill, the useful field of view (UFOV), has been consistently identified in studies as critical for driving safely. The UFOV integrates both visual sensory abilities and cognitive function.10 In one study, older drivers with a deficit in UFOV were 15.6 times more likely to crash at an intersection than peers with intact UFOV.17 Although formal UFOV testing requires specialized equipment and cannot be performed in most primary care offices, clinicians can easily screen for visual field
deficits by confrontation testing. Deficits or conditions that might limit UFOV or visual fields, such as prior stroke or glaucoma, should prompt referral to an occupational therapist or driving rehabilitation specialist for more formal UFOV testing.

**Physical Function**

The evolution of automotive technology has made driving a less physically demanding task. Yet, certain motor and physical skills are still required to safely operate a motor vehicle. General measures of physical function have been correlated with driving fitness. For instance, inability to perform activities of daily living and instrumental activities of daily living can mark at-risk drivers. A history of falls may also portend unfitness to drive.18

Targeted physical examination should include basic visual acuity and visual field testing and neurologic and musculoskeletal examination to identify loss of proprioception, reduced grip or lower extremity strength, and impaired neck, upper extremity, or lower extremity range of motion, all of which can impact driving ability. Deficits do not necessarily require the driver to cease driving immediately but may require accommodations such as additional mirrors, hand controls, or retraining and driving rehabilitation. Drivers with substantial hearing impairment should also be identified and referred to audiology or a driving rehabilitation specialist.

Office examination should also include a test of ambulatory function, such as a Rapid Pace Walk. This test quickly measures lower limb strength, endurance, range of motion, and balance. The patient is timed walking 10 feet utilizing their normal assistive gait device. Those requiring more than 9 seconds have been identified as being at increased risk for at-fault motor vehicle crashes.19 The clinician can then review potential causes of their slowed gait and consider whether an intervention is needed.

**Comorbid Conditions**

Certain medical diagnoses, including those that might impact vision, physical function, and mobility or lead to sudden changes in alertness or function, could impact fitness to drive. These factors include both acute (eg, acute myocardial infarction, vertigo, seizure, recent surgery) and chronic (eg, cardiovascular disease, diabetes, psychiatric disease, obstructive sleep apnea, seizure disorder, cerebrovascular disease) conditions. Clinicians should specifically screen for chronic conditions, such as those highlighted by the AGS’s Clinician’s Guide to Assessing and Counseling Older Drivers, 4th edition.1

**Medications**

Similar to screening for comorbid medical conditions, medications (including both prescription and over-the-counter medications) should be reviewed thoroughly. Special attention is needed to identify those with anticholinergic or sedating properties or with potential to alter consciousness or physical function (eg, hypoglycemics or antihypertensives). New medications and dose adjustments should be reviewed carefully for efficacy and adverse effects. Medications with potential to impair or affect driving safety include anticholinergics/antimuscarinics, anticonvulsants, antidepressants, antihistamines, antihypertensives, antiparkinsonian agents, antipsychotics, hypoglycemics, sedative hypnotics such as benzodiazepines, muscle relaxants, opioids, and stimulants.

State-specific regulations address certain high-risk medications. For instance, Minnesota statute dictates that driving while under the influence of a controlled substance (Schedule I-V) that affects the nervous system, muscles, or brain is considered impaired driving.20 For seniors, impairing

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**TABLE. In-Office Cognitive Assessment Tools for Older Drivers**

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<thead>
<tr>
<th>Assessment tool</th>
<th>Score suggesting risk for unsafe driving</th>
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<tbody>
<tr>
<td>Montreal Cognitive Assessment</td>
<td>≤18 (score range, 0-30)11</td>
</tr>
<tr>
<td>Trail Making Test, Part B</td>
<td>≥180 seconds or ≥3 errors</td>
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<tr>
<td></td>
<td>(“3 minutes or 3 errors” rule)14</td>
</tr>
<tr>
<td>Maze test</td>
<td>&gt;60 seconds or &gt;1 error13</td>
</tr>
<tr>
<td>Mini-Mental State Examination</td>
<td>≤24 (score range, 0-30)8</td>
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The effects of medications are more pronounced and result in fatal outcomes. Although prescribers are not liable for issuing a prescription for a controlled substance, it is important for clinicians to counsel patients on the risks and adverse effects of the medication and the legal implications of driving while under the influence of a controlled substance. These discussions should be clearly documented in the medical record.

INTEGRATING FINDINGS INTO MANAGEMENT
The goal of in-clinic testing should be to determine which patients should not drive (red light), those who may safely continue driving (green light), and those who should be referred for further testing (yellow light).

This method of “trichotomizing” the older adult driving population allows clinicians to identify those at highest risk. The Figure offers an example of categorizing drivers during office assessment.

Management of the “yellow light” driver is individualized based on the patient’s particular risk profile. Clinical pathways include mitigation of risk through condition management, further evaluation with a driving rehabilitation specialist, or requirement for retesting.

The 76-year-old retired professor described at the beginning of this article offers an example of a “yellow light” driver. Using the aforementioned paradigm, he has several

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<th>Driving fitness</th>
<th>Examples of assessment results</th>
<th>Next steps</th>
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| **High-risk driver** | • Uncontrolled medical condition(s) impacting safety  
• Visual acuity ≤20/50, unable to be corrected  
• Moderate-severe dementia | • Recommend immediate driving retirement  
• Provide alternative transportation solutions |
| **Moderate-risk driver** | • Crash or close-call within past year  
• Care partner or family concern  
• Reported change in driving habits  
• High-risk medications  
• Visual field deficit  
• Hearing impairment  
• Reduced neck range of motion  
• Leg strength <4/5  
• Rapid pace walk ≥9 s  
• MoCA ≤18, MMSE ≤24 | • Refer to driving rehabilitation specialist  
• Formal evaluation at DMV  
• Dialogue about driving retirement |
| **Low-risk driver** | • No risky medications  
• Medical conditions well controlled  
• No crashes or care partner concerns  
• Independent in traditional ADLs, IADLs  
• Visual acuity (corrected) >20/50 (or state standard)  
• No visual field deficits  
• Full neck range of motion  
• Leg strength ≥4/5  
• Rapid pace walk <9 s  
• MoCA >18 or MMSE >24 | • Reassess driving fitness periodically  
• Continue dialogue about future driving retirement |

**FIGURE.** Categorizing older driver fitness based on clinical assessment. ADLs = activities of daily living; DMV = department of motor vehicles; IADLs = instrumental ADLs; MMSE = Mini-Mental State Examination; MoCA = Montreal Cognitive Assessment; MVC = motor vehicle collision.

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findings on clinical assessment that might raise concern about his driving fitness, yet no clear indication that he must stop driving immediately. Although the clinician may be able to adjust medications to decrease risk, he is a good candidate for a driving rehabilitation program and potentially addition of adaptive equipment to compensate for reduced neck range of motion.

**Driving Rehabilitation Programs**
Driving rehabilitation specialists are commonly occupational therapists (80%) trained specifically in evaluation of driver safety and retraining. These professionals are often affiliated with medical centers, rehabilitation facilities, driving schools, and state departments of motor vehicles. In addition to a comprehensive clinical assessment, driving rehabilitation specialists can assess drivers on the road under normal driving circumstances. They may advise restrictions, attendance of remedial driving courses, driving equipment adaptation, or cessation of driving if the potential for improvement is poor. Further, driving rehabilitation specialists may train the older adult to utilize assistive devices, such as larger mirrors or hand controls, or plan safer driving routes to minimize risk. The program may require written prescription that includes a clear indication for the referral. Unfortunately, only a small fraction of the cost of these programs is covered by health or automobile insurance (median cost, $400). If cost or availability remains a barrier to a rehabilitation program, department of motor vehicles behind-the-wheel testing may be a reasonable alternative.

**Reporting Unsafe Drivers**
Reporting of unsafe drivers varies by state, and health care professionals must be aware of their state’s laws. In states with mandatory reporting, clinicians are required by law to inform their local department of motor vehicles of potentially unsafe drivers. In states with voluntary reporting, such as Minnesota, for unsafe drivers who refuse clinician recommendations for additional evaluation or driving cessation, clinicians should inform their patients of their ethical responsibility to report their concerns. The report should include the full name and date of birth of the driver, a general explanation of the medical condition or reason the driver is likely unsafe, and the reporter’s name, address, and phone number.

**PLANNING FOR DRIVING RETIREMENT AND ALTERNATIVE TRANSPORTATION**
Regardless of results of in-office screening, anticipatory guidance and an advanced driving directive may be a useful outcome of the clinical encounter. Most older adults will experience a period of driving retirement of at least 6 to 10 years before the end of their life. As in other aspects of shared decision making, preventive counseling can help empower older patients to make informed decisions about driving habits and plan for the future. Directives may have a special role in early cognitive impairment to help guide future decisions by the patient, family, and clinician once the patient is unable to recall details of earlier conversations.

Once a recommendation for retirement is made, or as part of advanced planning, clinicians should be prepared to provide a list of transportation alternatives, with a goal of tailoring to the older adult’s unique situation. Options may include walking, public transportation, retirement community shuttles, community volunteer drivers, delivery services, friends, and family. Senior ride options are changing in the era of app-based ride services, and new services linking older adults to rides are emerging. Local resources can be accessed through the Area Agency on Aging, local county offices, and the Alzheimer’s Association links to local chapters.

All this information must be clearly and compassionately delivered to the patient and their care partner (when applicable). Clinicians must address the impact of their advice on their patient’s emotional health, as driving cessation not only impacts an individual’s independence but may also impact self-esteem and perceived locus of control. Additionally, this recommendation should be written down for the patient and be...
included in their medical record. A written prescription stating “do not drive” or the use of an advance driving directive are powerful tools that can be utilized in the office or hospital setting.

**CONCLUSION**

As the driving population ages, generalists have a unique opportunity to impact transportation for their older patients. Understanding and adoption of a 5-domain assessment strategy as outlined here allows clinicians to discriminate at-risk from safe drivers and facilitate appropriate referral for additional testing or rehabilitation.

**Abbreviations and Acronyms:** AGS = American Geriatrics Society; CDR = Clinical Dementia Rating; UFOV = useful field of view

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