Older Adult Drivers with Cognitive Impairment

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As the number of drivers with cognitive impairment increases, family physicians are more likely to become involved in decisions about cessation of driving privileges in older patients. Physicians who care for cognitively impaired older adults should routinely ask about driving status. In patients who continue to drive, physicians should assess pertinent cognitive domains, determine the severity and etiology of the dementia, and screen for risky driving behaviors. Cognitive impairment detected by office-based tests may indicate that the patient is at risk of a motor vehicle crash. Referral for performance-based road testing may further clarify risk and assist in making driving recommendations. Physicians should assist families in the difficult process of driving cessation, including providing information about Web sites and other resources and clarifying the appropriate state regulations. Some states require reporting of specific medical conditions to their departments of motor vehicles. (Am Fam Physician 2006;73:1029-34, 1035-6.

▶ **Patient information:** A handout on driving and dementia, written by the authors of this article, is provided on page 1035.

The automobile typically is the most important form of transportation for older adults, and the ability to drive often is a key element in maintaining independence. However, individual autonomy in driving must be balanced with public safety. A range of medical problems can affect the ability of older adults to drive safely; cognitive impairment, including dementia, plays an increasingly important role in this risk.[1,2] As the population ages, family physicians are more likely to become involved in decisions about driving by older persons with cognitive impairment.

Cognitive impairment is defined as a decline in at least one of the following domains: short-term memory, attention, orientation, judgment and problem-solving skills, and visuospatial skills. Dementia, as defined by the *Diagnostic and Statistical Manual of Mental Disorders*, 4th ed.,[3] includes the presence of memory loss and a decline in at least one other cognitive domain, as well as functional, social, or occupational impairment. Alzheimer's disease is an irreversible neurodegenerative disease and is the most common cause of dementia in older adults. Mild cognitive impairment is defined as cognitive deficits that fall short of the diagnostic criteria for dementia; data are limited about driving performance in patients with this condition.

Epidemiology

Outpatient surveys indicate that about 30 percent of older adults with dementia are current drivers.[4] One study[5] estimates that about 4 percent of male drivers older than 75 years have dementia. The number of older adult licensed drivers is anticipated to increase from 13 million to 30 million by 2020.[6] In the future, older drivers also are expected to drive more miles than current older drivers,[7] which may increase the absolute number of crashes attributed to this age group. Despite limited exposure because of the reduced number of miles driven by older persons, reporting limitations, and the fact that crashes are rare events, most studies have indicated at least a twofold increased risk of crashes in drivers with dementia. In addition, older adults are more likely than middle-aged drivers to have fatal crashes.[8]

Even without a crash or subsequent injury, all older adults with dementia eventually must stop driving. Patients' families or caregivers may be concerned about the risk of a crash and injury or about the driver becoming lost.

SORT: KEY RECOMMENDATIONS FOR PRACTICE

Clinical recommendation	*Evidence rating*	*References*
Brief, office-based tests should be used to stratify risk for older drivers with cognitive impairment.	C	15
Physicians should counsel families about driving cessation and suggest alternative transportation options.	C	17
Physicians should consider referring older drivers with cognitive impairment to a driving rehabilitation specialist for a driving test.	C	17

A = consistent, good-quality patient-oriented evidence; B = inconsistent or limited-quality patient-oriented evidence; C = consensus, disease-oriented evidence, usual practice, expert opinion, or case series. For information about the SORT rating system, see page 956 or http://www.aafp.org/afpsort.xml.

It is important for older adults to maintain links to society when they stop driving. Driving cessation has been associated with depression and social isolation in older adults. One study[9] found that adults with dementia who have stopped driving no longer reach as many destinations, even with the availability of a licensed driver in their household.

The Family Physician's Role

Physicians may be unfamiliar with the evaluation of driving abilities in older adults and the community resources that can provide assistance to these patients. Office assessment should include a history from an informant who has observed a patient's driving skills; the history should focus on unsafe driving behaviors, assessment of the patient's cognitive domains, estimation of dementia severity, and medication review. When concerns are raised about driving safety, referral to a driving rehabilitation specialist or the state's department of motor vehicles (DMV) for performance-based road testing may be an option. Physicians also should be willing to refer patients to a social worker or community agency that provides transportation when they are no longer able to drive.

The risk of having an automobile crash doubles in older drivers who have dementia.

DRIVING HISTORY

A knowledgeable informant who has observed the patient's driving skills can be useful in determining whether a patient with dementia should stop driving. In research settings, informant observations have detected dementia reliably and accurately, even when cognitive impairment is very mild.[10,11] Physicians should inquire about abnormal driving behaviors that may be apparent in persons with mild dementia *(Table 1)*. The presence of these behaviors should represent a change from baseline that coincides with the course of cognitive decline.

ASSESSMENT OF COGNITIVE DOMAINS

A growing consensus exists among physicians and experts that several conditions and decrements in physiologic variables can affect driving skills. Several tests can be administered by physicians in the office setting (e.g., static visual acuity [Snellen chart], hearing [whisper

TABLE 1
Indicators of Unsafe Driving

Crashes
Dents on car
Difficulty understanding traffic signs
Driving too fast or too slow
Failure to notice street signs
Getting lost in familiar areas
Indecent gestures or horn honking from other drivers
Miscalculating speed and distances
"Near misses"
Poor judgment
Tickets for traffic violations
Tunnel vision

test or handheld audiometry], timed gait, joint range of motion, muscle strength). These tests have been endorsed by the American Medical Association (AMA) for assessing and counseling older adult drivers.[12]

The AMA also recommends two cognitive tests, the Clock Drawing Test[13] and the Trails B test.[14] Both tests rely on attention, executive function, memory, and visuospatial skills. Poor performances on these types of tests have been correlated with poor driving outcomes in older adults with dementia (e.g., increased crash rates, impaired performance in driving simulations and performance-based road tests).[15] These tests take about five minutes to administer together; test stimuli, scoring instructions, and references are available on the AMA Web site.[12] Abnormal scores on the Clock Drawing Test or a score of 180 seconds or longer on the Trails B test indicate an increased risk of unsafe driving. The scores alone should not result in cessation of driving privileges, but they indicate that the patient needs further evaluation. Conversely, normal test results do not necessarily indicate that the patient is safe to drive[16]; information from the informant or assessment by a driving rehabilitation specialist still may be warranted.

ASSESSMENT OF DEMENTIA SEVERITY

Although some experts have recommended that all older adults with dementia refrain from driving, the majority of physicians are likely to base this decision on dementia severity[17] or a demonstration of impaired driving competence.[18] Several guidelines on evaluating older drivers with dementia have been published.[19] An evidence-based review[17] concluded that persons with mild dementia or a Clinical Dementia Rating (CDR) score of 1 should not drive.

The CDR has been well validated as a measure of dementia severity.[20] The level of dementia severity may be a reasonable proxy for assessing the ability to drive because of the barriers to road testing (e.g., safety, availability, cost, willingness of the driver to take the test). Conversely, many physicians may not be able to administer the CDR because of time restraints, cost, and the need for special training. Training in administering the CDR is available online at http://alzheimer.wustl.edu/cdrtraining.

Although some patients may be able to drive safely in the early stages of dementia,[21] physicians should expect driving skills to deteriorate over time.[22] Planning for repeat testing and eventual driving cessation is critical.

MEDICATION REVIEW

Polypharmacy is common in older adults. Sedating medications may be a potentially reversible cause of cognitive impairment and exacerbation of crash risk in older adults. Medications that may cause driving impairment include but are not limited to narcotics, benzodiazepines, antihistamines, antidepressants, antipsychotics, hypnotics, alcohol, and muscle relaxants. Reports suggest that a significant number of older adults may drive while intoxicated or under the influence of other medications.[23,24] Physicians should review medications in detail with each patient, including nonprescription drugs and herbal supplements, and attempt to discontinue medications that have the potential to adversely affect driving or cognition.

Driving cessation has been associated with depression and social isolation in older adults.

Performance-Based Road Testing

Road tests evaluate practical driving skills. Driving evaluations cost about $200 to $500 and might not be covered by medical insurance. Road testing is considered the preferred method of assessing driving competence,[18] although tests often are conducted in an unfamiliar environment and car. Occupational therapists may have specific training and experience in evaluating drivers with dementia. However, they usually are located in urban areas, and thus availability is limited. Even if a driver with early dementia passes a road test, progression of the disease and difficulties on repeat road tests can be expected.[22] Repeat testing at six- to 12-month intervals is important because driving skills can be anticipated to decline.

As a practical strategy, restricting driving in patients with dementia may not have a significant effect on crash reduction because

TABLE 2
Driving Cessation Strategies

Arrange intervention by family, friends, or police
Change car locks
Disable or move car
Ensure appropriate alternative transportation
File down ignition key
Inform patient of financial risks if he or she continues to drive with a dementing illness
Move patient to assisted-living or long-term care facility
Provide verbal and written recommendations
Recommend revocation of driver's license
Refer patient for performance-based road test

patients may forget or disregard these instructions. Driving with a family member who can enforce restrictions is an option for drivers with very mild dementia who pass a road test.

Driving Cessation

Physicians may be involved in discussions about driving with patients and their families, especially when dementia has progressed to the point of impairing driving skills. The physician can play an important role in recommending road testing, enforcing driving cessation, helping the patient accept the decision, and suggesting alternative transportation resources.[17] Caregivers, drivers, and transportation specialists expect physicians to take an active role and assist the family with these difficult decisions. The discussions should be documented in the patient's chart, and written information should be provided to the patient and the caregiver.

Lack of insight is one of the principal areas of concern for families of drivers with dementia. Some patients with dementia do not recognize the impairment in their driving ability and resist efforts to prevent them from driving. The patient's spouse, family members, physician, occupational therapist, and representatives of the state DMV may need to work together to prevent patients who are judged to be unsafe from driving. *Table 2* provides steps families and caregivers can take to stop older adults with dementia from driving.

TABLE 3
Physician and Caregiver Resources for Drivers with Dementia

Eldercare (http://www.eldercare.gov)
AAA Foundation for Traffic Safety (http://www.seniordrivers.org)
Community Transportation Association (http://www.ctaa.org/ntrc/senior_publications.asp)
American Public Transportation Association (http://www.publictransportation.org/systems/)
Easter Seals (http://www.easter-seals.org/ntl_trans_care)
National Association of Area Agencies on Aging (http://www.n4a.org)
National Highway Traffic Safety Administration (http://www.nhtsa.dot.gov/people/injury/olddrive/)
American Occupational Therapy Association (http://www.aota.org/olderdriver)
Association for Driver Rehabilitation Specialists (http://www.aded.net)
American Medical Association (http://www.ama-assn.org/go/olderdrivers)
Administration on Aging (http://www.aoa.gov)

Adapted with permission from Carr D, Rebok GW. The older adult driver. In: Gallo JJ, Bogner HR, Fulmer T, Pareza GJ, eds. Handbook of geriatric assessment. 4th ed. Boston: Jones and Bartlett, 2005:53.

Caregiver and Physician Resources

Several organizations and Web sites are available to provide information on driving and dementia *(Table 3)*.[25] The Alzheimer's Association assists families with counseling and education about driving issues. The Older Drivers Project sponsored by the AMA developed office-based assessments of functional abilities related to driving, a reference table of medical conditions with safety recommendations for several diseases, recommendations for counseling patients on driving cessation, and a discussion of the legal and ethical issues associated with the care of unsafe drivers. These tools are available in the *Physician's Guide to Assessing and Counseling Older Drivers* (http://www.ama-assn.org/ama/pub/category/10791.html).

The book *The 36-Hour Day*[26] includes a chapter on driving for caregivers of patients with dementia. The GrandDriver program from the American Association of Motor Vehicle Administrators provides information on many resources for older adults (http://www.granddriver.info).

Ethical, Legal, and Public Policy Issues

Patients and their families do not always comply or agree with a physician's recommendation to stop driving. Physicians should

ensure that the recommendation on driving cessation is provided to someone with decision-making capacity for the patient, and document any refusal in the patient's chart. This situation may justify a letter to the state DMV. The DMV ultimately has the final decision regarding whether someone may remain licensed to drive. Most states follow the advice of the physician or occupational therapist, although there are appeal processes. The decision to report patients to the DMV varies depending on personal practices and state requirements. Because statutes vary between states, legal counsel should be obtained to help guide the evaluation process and determine the regulations that apply. Some states require physicians to report specific medical conditions to the DMV.

An Office Protocol

Physicians should routinely ask if an older adult with memory loss is actively driving. If an active driver is diagnosed with dementia, inquiries should be made about potentially dangerous behaviors such as those listed in *Table 1*. A review of the psychometric profile is appropriate for assessing cognitive problems that may indicate that the driver could be at risk of crashing. A review of medications also should be performed.

Performance-based road testing by a driving rehabilitation specialist is recommended for older adults with dementia in the very mild or mild stages of disease.[17] Referral to the DMV also can be considered. In-person license renewal may encourage identification of higher-risk drivers, according to a retrospective, longitudinal study[27] of all fatal crashes in the contiguous United States from January 1990 through December 2000. This study used the Fatality Analysis Reporting System to identify crashes based on the driver's age (i.e., 25 to 64 years, 65 to 74 years, 75 to 84 years, and 85 years and older). In-person license renewal was related to a significantly lower fatality rate in the oldest group of drivers. More stringent state licensure policies such as vision tests, road tests, and shorter license renewal cycles were not independently associated with additional benefits.

If the patient is considered to be capable, he or she may continue to drive with ongoing monitoring by the family and a repeat road test every six to 12 months. If the patient is found to be incapable, strategies for driving cessation are indicated, and referral to alternate methods of transportation is necessary. Patients who resist their families' efforts to keep them from driving may be more receptive to the recommendation if it is suggested by a physician. Written instructions should be provided for the patient and family. Referral to the state DMV is necessary when patients and families do not comply with appropriate recommendations to stop driving.

Research and Clinical Needs

Further studies are needed to confirm the clinical utility of office-based screening, including test characteristics and their predictive value of driving impairment. More efforts are needed to understand social or family barriers that may delay driving cessation in older adults with dementia. Additional driving rehabilitation specialists are needed, especially in nonurban areas, as are consistent driving-test reimbursements from insurance companies. Physicians must know the method of referral for unsafe drivers in their state and the laws that may or may not protect them when referring unsafe drivers with dementia. Finally, the effect of pharmacologic therapy for dementia on driving has not been studied rigorously. Although current treatment may be unlikely to improve driving skills, the possibility of delaying driving cessation in patients with very early disease may be a fruitful area of research.

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