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DRIVING WITH DEMENTIA

How to assess safety behind the wheel

Cognitive tests are not sufficient to evaluate driving fitness in patients with Alzheimer's disease

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Mr. D, age 75, presents to your office with a 5-year history of gradually declining memory. His wife reports he is having difficulty with word finding, managing his finances, and shopping, and he needs supervision when using the stove. Nonetheless, he enjoys playing golf and drives himself to the golf course 3 times a week. He is compliant with his chronic medical therapy for hypertension, hypercholesterolemia, and asthma.

Patients with dementia who continue to drive pose a potential danger on the road, worry their families, and present challenges to clinicians. Most people would agree that patients with moderate or severe dementia should not drive, but a careful evaluation is required to assess whether a patient such as Mr. D with mild dementia remains fit to drive.

This article explores how dementia exacerbates age-related changes in driving ability and discusses how to assess driving in patients with dementia. Our goal is to help clinicians sort through data from in-office physical and cognitive assessments, family caregivers/informants' reports, and (when available) on-road testing. We also discuss:

- guidelines for assessing older drivers that can help balance patients' need for autonomy with public safety
- strategies for discussing driving cessation with patients and their families.

continued



Driving with dementia

Clinical Point

Under many conditions, a patient with dementia can produce a high MMSE score and yet be an unsafe driver

Table 1 Age-related changes that may affect driving fitness

Decreased physical capabilities, including declining muscle tone, flexibility, and reaction time
Decreased hearing and visual acuity
Increased fragility, resulting in longer time to heal should injuries occur
Increased medication use with possible side effect of drowsiness
Source: References 7,8

Table 2 Older drivers' common traffic violations leading to crashes*

Failure to obey traffic signals, including stop signs and red lights
Unsafe left turns (driver may inaccurately judge speed of oncoming vehicle)
Inappropriate turns (such as difficulty judging distance from oncoming cars, wide or narrow turns, or not timing the turn correctly with traffic lights)
Unsafe passing
Failure to yield
* These errors often lead to multivehicle accidents Source: References 7,8

Driving: A privilege, not a right

Driving is central to older adults' autonomy, and >75% of persons age ≥ 75 rely on driving as their primary mode of transportation.¹ Driving cessation in this population has been associated with a 3-fold decrease in out-of-home activity² and a 2.5-fold increase in depressive symptoms.³ Nonetheless, some 4.5 million Americans have Alzheimer's disease (AD),⁴ and dementia poses a substantial risk to safe driving.

Although driving must be sacrificed when personal and public safety is at risk, most physicians perceive an uncomfortable conflict of interest between patient confidentiality and public safety.⁵ Assessing driving safety of patients with dementia can undermine the doctor-patient relationship and pose hardships for patients.

Mr. D has a 5-year history of memory problems that affect his daily functioning,

yet he continues to drive. A longitudinal study of persons with dementia found that among the 29% who were driving at baseline, more than one-half were still behind the wheel 2 years later.⁶

Age and driving safety. Even in the absence of dementia, driving ability declines with aging (*Tables 1 and 2*).^{7,8} Older persons may self-regulate and restrict their driving to shorter distances, with fewer trips at night, on high-speed roads, or in unfamiliar situations. Their driving is rarely aggressive and they are unlikely to speed, but they may drive more slowly than other traffic.^{7,8} Although the overall rate of motor vehicle collisions declines with age:

- the rate of collisions per mile driven increases after age 65⁹
- drivers age >65 have the highest fatality rate per mile driven among adults age ≥ 25 .¹⁰

A dementia diagnosis is not sufficient to withdraw driving privileges, according to American Medical Association (AMA)/National Highway Traffic Safety Administration (NHTSA) guidelines. These recommend that you base decisions on the individual's driving ability, and—when you have concerns—factor in a focused medical assessment and formal assessment of driving skills.¹⁰

CASE CONTINUED

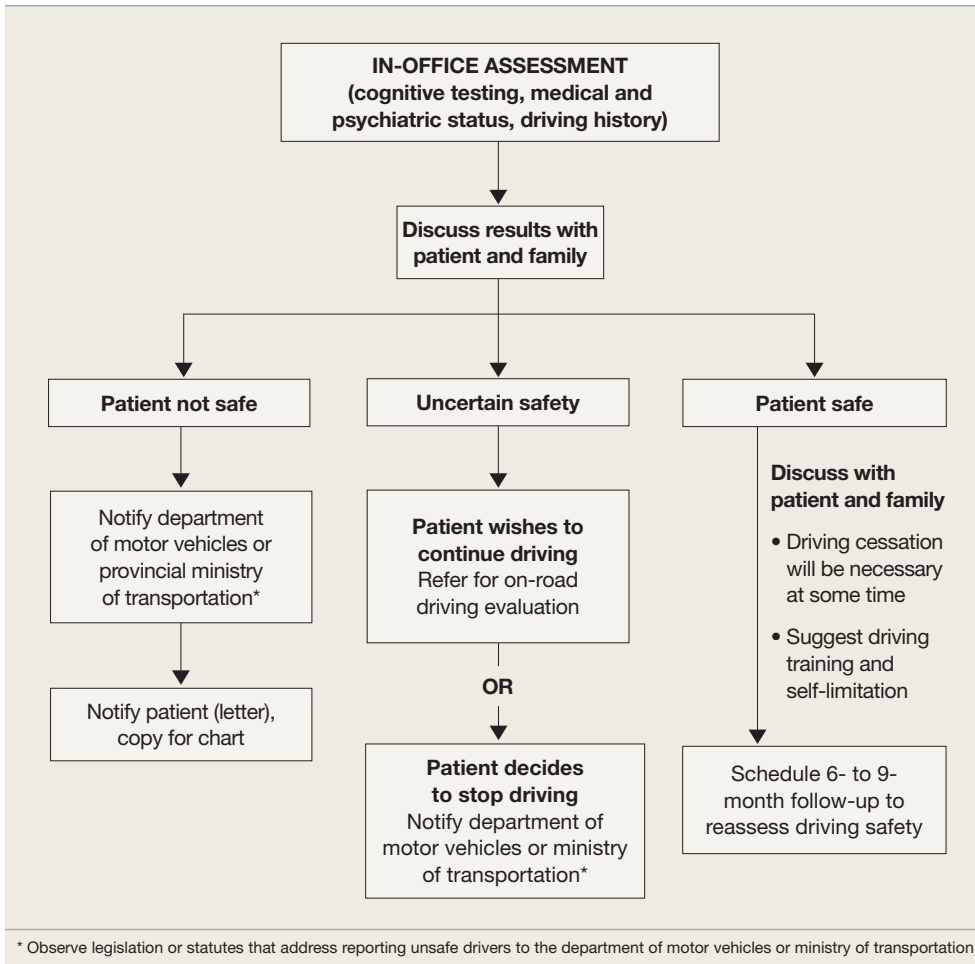
Cognitive deficits quantified

You perform a Mini-Mental State Examination (MMSE). Mr. D scores 24/30, losing 1 point for orientation, 2 points for attention, 2 points for recall, and 1 point for copying. This score, along with his history, indicates mild dementia, although he claims he is a safe driver. On further cognitive testing, Mr. D completes the Trails A test in 90 seconds and Trails B test in 250 seconds (well below 1.5 standard deviations of the norm for his age and education).¹¹ On the clock-drawing task, he drew a poorly organized clock, with unequal spaces between numbers and hands pointing to "10" and "11" instead of properly indicating "10 after 11."

Mr. D and his wife live in a rural area, 5 miles from the nearest grocery store. His wife never drove, and she relies on him for weekly

Algorithm

3 options for drivers with dementia, based on in-office assessment



Clinical Point

Consider all aspects of the patient's clinical status; anything could change a safe driver with mild dementia into an unsafe driver

shopping trips and to drive her to her bridge club. She denies any problems with his driving but states, "Other drivers have become so aggressive; they're always honking at him." Their daughter denies that Mr. D has driving problems but admits that for the last 2 years she has refused to allow her child to ride in his car.

Focused in-office assessment

Information to assess driving ability can come from the patient, family caregiver/informant, and clinical judgment. Patients with dementia are notoriously inaccurate in self-reported driving ability, either for lack of insight or as a testament to the importance of driving to their autonomy. Caregivers often are more accurate in describing a patient's driving, but other agendas may color their responses.

In a study of patients with very mild or

mild AD, 94% reported themselves as safe drivers, whereas on-road driving instructors rated <50% of drivers in these groups as safe. Caregivers were better able to classify driving performance, but 36% of their ratings were incorrect.¹²

Cognitive assessment. To assess older drivers' cognition, AMA/NHTSA's *Guide to Assessing and Counseling Older Drivers* recommends the Trail-Making Test, Part B and the clock-drawing test.¹⁰ The Canadian Medical Association suggests the MMSE.¹³ Both guides say that abnormalities in these tests indicate a need for more detailed testing, including referral to specialized driving assessment and retesting at regular intervals (*Algorithm*). Retest patients with mild dementia at least every 6 months or sooner when dementia severity increases noticeably¹⁴ (*Box 1, page 45*).^{6,15}

continued on page 45

The MMSE is widely used to screen for cognitive impairment and identify dementia or delirium, but it is not a diagnostic tool or proxy driving test. A patient with dementia may produce a high MMSE score and yet be an unsafe driver. For example, well-educated patients or those with vascular or frontotemporal dementia may retain cognitive abilities as measured by the MMSE until later in the disease.

Considerable effort has been put into developing tools to help clinicians quickly and accurately differentiate safe from unsafe drivers by assessing cognition. Unfortunately, no consistent link has been found between cognitive test results and driving outcome measures. A systematic review of office-based predictors of fitness to drive in dementia found 5 studies showing an association between MMSE scores and driving and 5 studies showing no such association.¹⁶ Thus, although the AMA/NHTSA guide recommends the MMSE, Trails B, and clock-drawing tests, cognitive tests—including these—are not sufficient to assess driving ability.

Severity of dementia. International consensus groups have attempted to create guidelines for patients with dementia who drive. American, Canadian, and Australian groups suggest that a diagnosis of moderate to severe dementia precludes driving, and the driver's licenses of persons with these conditions should be revoked.¹⁷

In general, AD is considered severe when the MMSE score is <10 or the patient becomes dependent on a caregiver for survival.¹⁸ AD of moderate severity is more difficult to define, but a Canadian consensus conference suggested a practical approach: Patients with AD would be considered to have moderate to severe dementia and should not drive when they cannot independently perform multiple instrumental activities of daily living or any of the basic activities of daily living.¹⁹

Some dementias may impair driving more quickly than AD does. For example, hallucinations may occur early in Lewy body dementia, as may impulsivity in frontotemporal dementia and motor impairment in vascular dementia.

Box 1 Case report: AD-related behavioral symptoms

Mrs. Y visits your office for a follow-up regarding mild Alzheimer's disease (AD), which was diagnosed 2 years ago. She passed an on-road test 3 months ago and has an Mini-Mental State Examination score of 24/30. Over the last month she has become depressed, with insomnia and mild psychomotor retardation. She occasionally has hallucinations.

Behavioral and psychological symptoms such as agitation, aggression, hallucinations, apathy, depression, and anxiety are common neuropsychiatric sequelae of AD. Little is known about the risks these symptoms pose to road safety, but we recommend that clinicians strongly consider the potential for impaired driving.

In a longitudinal study, cognitive impairment and behavioral disturbances—especially agitation, apathy, and hallucinations—were strong predictors of driving cessation among patients with dementia.⁶ Furthermore, a case crossover study of patients with dementia found a 54% increase in risk of motor vehicle collisions associated with the use of psychotropic medications.¹⁵

Consider all aspects of the patient's clinical status, including neuropsychiatric symptoms, psychotropic medications, comorbid medical conditions (including hearing and vision impairment), and concomitant therapy for medical conditions. Any could change a safe driver with mild dementia into an unsafe driver.

On-road driving tests

Because some individuals with mild dementia can drive safely for extended periods, international recommendations for assessing the driver with dementia emphasize on-road driving tests.^{10,13,20-22} American¹⁰ and Canadian guidelines¹³ suggest that a dementia diagnosis is not sufficient to withdraw licensure.

A formal driving assessment is necessary to establish road safety for patients with mild dementia except when the need for license withdrawal is evident, such as when the patient has:

- a history of major driving problems (such as crashes or driving the wrong way on a highway)

Clinical Point

Sometimes it helps to give the patient a prescription in his name that says, 'Do not drive.' Provide a copy to the family to use as a reminder



Driving with dementia

Clinical Point

Driving restrictions, cognitive enhancers, and passenger 'co-pilots' have not reduced crash rates in studies of drivers with dementia

Box 2

When your patient is unfit to drive: 4 steps to driving cessation

1. Meet with family first. Help them assume a positive and supportive role. Explain concretely and empathically your concern for the safety of the patient and others. Clearly outline your findings that the patient is not fit to drive, and explain that the law requires you to report the patient to the authorities.

Remind family members that the goal of driving assessment is to prevent a collision, and they carry some responsibility because they are aware of the potential risk of letting their family member continue to drive. If necessary, have family members witness a repeat performance by the patient on the most revealing test. Discuss the importance of finding alternate transportation to reduce the risk of isolation and depression that can follow driving cessation.

2. Meet with patient. Having the family present can be helpful, but ask them to assume a supportive role. Give the patient a positive role by recognizing that he or she has been a responsible driver, and part of this responsibility is to stop driving before an accident occurs. Acknowledge that it is normal to be unhappy upon learning that one's driving privileges are being revoked.

Sometimes it helps to give the patient a prescription in their name that says, "Do not drive." Families who receive a copy may find this very helpful, too, for reminding the patient later about what you said.

If your patient argues with your position, remain firm and do not argue. Indicate that you have made notes on the meeting and are notifying the authorities about the patient's unsafe driving. You can add that your chart could be subpoenaed and the patient may be legally liable and financially responsible should he or she continue to drive and have a collision.

3. Talk about transportation options.

Family members could share driving responsibilities. Taxi rides can cost less than maintaining a car if the patient drives <4,000 km (2,500 miles) per year. Suggest that patients or families find volunteer drivers or contact helpful taxi drivers a day before an outing is planned.

4. If patient refuses to comply, meet with the family again and encourage them to remove the patient's opportunity to drive (confiscate the keys, disable the car, or remove the car altogether).

Provide a written statement to the patient and family outlining why the patient can no longer drive. Indicate that it is your legal responsibility to report unsafe drivers, and you intend to notify the authorities regarding the patient's driving status. If the patient remains noncompliant, continue to encourage family to remove the opportunity to drive.

- significant contraindications to driving on the history or physical examination (such as severe inattention or psychosis).

Challenges of on-road testing. On-road tests may be the gold standard, but they are not without clinical problems.

Need to retest. Because almost all dementias are progressive and driving skills deteriorate over time, most guidelines recommend periodic retesting. For patients with dementia who pass on-road evaluations, limited evidence supports retesting every 6 months.¹⁴ Take an individual approach, however, because of the various rates at which the dementias progress.

Testing vs real world conditions. Structured on-road testing is not equivalent to unstructured real-world driving, in which

the patient often must navigate without instruction or assistance.

Rural vs urban driving. Road tests conducted in urban areas assess skills associated with complex conditions and the need to respond quickly to crises. They might not assess as well rural driving, which requires sustained attention on monotonous roads.

Inaccessibility. Cost and lack of availability of on-road tests, particularly in rural areas, limit the number of patients whose performance can be evaluated.

CASE CONTINUED

Distressing results

Mr. D has a history of decline in cognition and function, objective cognitive difficulties, and a subtle history of driving problems. You refer him for a specialized on-road test, and the report indicates that he failed. Errors included

wide turns, driving too slowly, getting caught in an intersection twice during red lights while attempting to turn left, driving on the shoulder, and failing to signal lane changes. You review the results with Mr. D and his wife and recommend that he cease driving immediately.

Mr. D is furious, and his wife is dismayed. He demands to know how he can continue to play golf, which is his only form of exercise and recreation. Will she have to give up her bridge club? How will they shop for food? They request permission to at least to drive to the grocery store during the daytime.

You explain that no system allows individuals to drive only at certain times, and for the sake of safety you cannot grant them special permission. You discuss alternatives, such as asking their daughter for assistance with grocery shopping and taking taxis or ride-sharing with friends who play golf and bridge.

Remain firm, but ease the blow

Driving cessation orders distress patients, families, and clinicians. A failed road test clearly indicates unsafe driving, and driving cessation is critical to public safety.

A review by Man-Son-Hing et al²³ found that drivers with dementia performed worse than nondemented controls in all studies that examined driving performance (on-road, simulator, or caregiver report). Simulators showed problems such as off-road driving, deviation from posted speed, and more time to negotiate left turns.²⁴

By comparison, only 1 of 3 studies using state crash records showed an increased risk of collisions in persons with dementia compared with controls.²³ From a research

perspective, however, studies that use state-reported collisions to assess driving risk are confounded by driving restrictions on persons with dementia.

Mr. D wants to continue driving with restrictions. No studies have shown reduced crash rates when drivers with dementia used compensatory strategies such as restrictions, retraining/education, having a passenger “co-pilot,” on-board navigation, or cognitive enhancers.²³

If Mr. D had passed the road test, the situation would have been more ambiguous. Two studies have examined on-road driving performance over time in patients with early-stage dementia.^{25,26} Both studies followed drivers prospectively for 2 years, and those with mild dementia (vs very mild or no dementia) were most likely to show a decline in driving skills:

- All participants with mild dementia were rated as “not safe” by the end of 2 years by Duchek et al.²⁵
- Median time to “failure” (or a rating of unsafe) was 324 days for drivers with mild dementia vs 605 days for those with very mild dementia, as reported by Ott et al.²⁶

Mr. D’s passionate plea for reconsideration highlights the need for communities to develop alternate transportation for seniors whose driving becomes unsafe (**Box 2**).

Legal liability? Physicians often are concerned about legal responsibilities and risks involved in reporting unsafe drivers. Be aware of local statutes or legislations regarding mandatory reporting of patients you deem unsafe to drive.¹⁷ These laws usually protect physicians from lawsuits

Clinical Point

In a prospective study, all patients with mild dementia were found to be unsafe drivers by the end of 2 years

Bottom Line

A dementia diagnosis is not sufficient to withdraw driving privileges. Carefully evaluate cognition, medical and psychiatric status, and driving history. Take steps to stop patients from driving if they have moderate to severe dementia, a history of traffic problems, contraindications such as inattention or psychosis, or if patients have mild dementia but fail an on-road driving test. Those with mild dementia who pass an on-road driving test can continue driving, but repeat testing at least every 6 months and monitor for increased dementia severity.



Driving with dementia

Clinical Point

Acknowledge that it is normal to be unhappy upon learning that one's driving privileges are being revoked

Related Resources

- Physician's guide to assessing and counseling older drivers. American Medical Association and the National Highway Traffic Safety Administration, 2003. www.nhtsa.dot.gov/people/injury/olddrive/OlderDriversBook.
- Determining medical fitness to operate motor vehicles. Canadian Medical Association. 2006. www.cma.ca/index.cfm/ci_id/18223/la_id/1.htm.
- Canadian Driving Research Initiative for Vehicular Safety in the Elderly (CanDRIVE). www.candrive.ca.

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related to violating patient confidentiality. Civil lawsuits remain possible, however, if clinicians fail to report an unsafe driver who subsequently is involved in a motor vehicle collision.²⁷

References

1. Stowell-Ritter A, Straight A, Evans EL. Understanding senior transportation: report and analysis of a survey of consumers age 50+. Washington, DC: American Association of Retired Persons; 2002.
2. Marottoli RA, de Leon CFM, Glass TA, et al. Consequences of driving cessation: decreased out-of-home activity levels. *J Gerontol B Psychol Sci Soc Sci* 2000;55(6):S334-40.
3. Marottoli RA, Mendes de Leon CF, Glass TA, et al. Driving cessation and increased depressive symptoms: prospective evidence from the New Haven EPESE. Established Populations for Epidemiologic Studies of the Elderly. *J Am Geriatr Soc* 1997;45(2):202-6.
4. Hebert LE, Scherr PA, Bienias JL, et al. Alzheimer disease in the US population: prevalence estimates using the 2000 census. *Arch Neurol* 2003;60(8):1119-22.
5. Jang RW, Man-Son-Hing M, Molnar FJ, et al. Family physicians' attitudes and practices regarding assessments of medical fitness to drive in older persons. *J Gen Intern Med* 2007;22(4):531-43.
6. Herrmann N, Rapoport MJ, Sambrook R, et al. Predictors of driving cessation in mild-to-moderate dementia. *CMAJ* 2006;175(6):591-5.
7. Hedlund J. *Countermeasures that work: a highway safety countermeasure guide for state highway safety offices*. Washington, DC: National Highway Traffic Safety Administration; 2006.
8. Dobbs B. Medical conditions and driving: a review of the literature (1960-2000). Washington, DC: National Highway Traffic Safety Administration; 2005. Available at: http://www.nhtsa.dot.gov/people/injury/research/Medical_Condition_Driving/pages/TRD.html. Accessed September 29, 2008.

9. Li G, Braver ER, Chen LH. Fragility versus excessive crash involvement as determinants of high death rates per vehicle-mile of travel among older drivers. *Accid Anal Prev* 2003;35(2):227-35.
10. Physician's guide to assessing and counseling older drivers. Washington, DC: National Highway Traffic Safety Administration; 2003. Available at: <http://www.nhtsa.dot.gov/people/injury/olddrive/OlderDriversBook>. Accessed September 29, 2008.
11. Yeudall LT, Reddon JR, Gill DM, et al. Normative data for the Halstead-Reitan neuropsychological tests stratified by age and sex. *J Clin Psychol* 1987;43(3):346-67.
12. Brown LB, Ott BR, Papanonatos GD, et al. Prediction of on-road driving performance in patients with early Alzheimer's disease. *J Am Geriatr Soc* 2005;53(1):94-8.
13. *Determining medical fitness to operate motor vehicles. CMA driver's guide*. 7th ed. Ottawa, Ontario, Canada: Canadian Medical Association; 2006.
14. Molnar FJ, Patel A, Marshall SC, et al. Systematic review of the optimal frequency of follow-up in persons with mild dementia who continue to drive. *Alzheimer Dis Assoc Disord* 2006;20(4):295-7.
15. Rapoport MJ, Herrmann N, Molnar FJ, et al. Psychotropic medications and motor vehicle collisions in patients with dementia (letter). *J Am Geriatr Soc* 2008;56(10):1968-70.
16. Molnar FJ, Patel A, Marshall SC, et al. Clinical utility of office-based cognitive predictors of fitness to drive in persons with dementia: a systematic review. *J Am Geriatr Soc* 2006;54(12):1809-24.
17. Rapoport MJ, Herrmann N, Molnar FJ, et al. Sharing the responsibility for assessing the risk of the driver with dementia. *CMAJ* 2007;177(6):599-601.
18. Herrmann N, Gauthier S, Lysy PG. Clinical practice guidelines for severe Alzheimer's disease. *Alzheimers Dement* 2007;3(4):385-97.
19. Hogan DB, Bailey P, Carswell A, et al. Management of mild to moderate Alzheimer's disease and dementia. *Alzheimers Dement* 2007;3(4):355-84.
20. *Assessing fitness to drive for commercial and private vehicle drivers*. Sydney, Australia: National Library of Australia; 2006. Available at: <http://www.austrroads.com.au/aftd/index.html>. Accessed November 4, 2008.
21. *Medical aspects of fitness to drive. A guide for medical practitioners*. Wellington, New Zealand: Land Transport Safety Authority; 2002. Available at: <http://www.transfund.govt.nz/licensing/docs/ltsa-medical-aspects.pdf>. Accessed September 29, 2008.
22. *At a glance guide to the current medical standards of fitness to drive*. Swansea, UK: Drivers Medical Group, Driver and Vehicle Licensing Agency; 2008. Available at: <http://www.dvla.gov.uk/medical/ata glance.aspx>. Accessed September 29, 2008.
23. Man-Son-Hing M, Marshall SC, Molnar FJ, Wilson KG. Systematic review of driving risk and the efficacy of compensatory strategies in persons with dementia. *J Am Geriatr Soc* 2007;55(6):878-84.
24. Cox DJ, Quillian WC, Thorndike FP, et al. Evaluating driving performance of outpatients with Alzheimer disease. *J Am Board Fam Pract* 1998;11(4):264-71.
25. Duchek JM, Carr DB, Hunt L, et al. Longitudinal driving performance in early-stage dementia of the Alzheimer type. *J Am Geriatr Soc* 2003;51(10):1342-7.
26. Ott BR, Heindel WC, Papanonatos GD, et al. A longitudinal study of drivers with Alzheimer disease. *Neurology* 2008;70(14):1171-8.
27. Molnar FJ, Byszewski AM, Marshall SC, Man-Son-Hing M. In-office evaluation of medical fitness to drive: practical approaches for assessing older people. *Can Fam Physician* 2005;51:372-9.

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