

Which older patients are competent to drive?

Approaches to office-based assessment

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ABSTRACT

OBJECTIVE To review three proposed approaches to office-based assessment of older drivers and to evaluate recommendations made about dementia and driving.

QUALITY OF EVIDENCE The American Medical Association's (AMA's) *Physician's Guide to Assessing and Counseling Older Drivers* gives recommendations for office-based assessment of older patients' medical fitness to drive. Other approaches examined were those outlined in the sixth edition of *Determining Medical Fitness to Drive* produced by the Canadian Medical Association (CMA) and SAFE DRIVE. Recommendations for dementia and driving from these documents and other sources were reviewed. All evidence was level III.

MAIN MESSAGE The AMA document usefully identified ways to detect drivers at risk and key areas for assessment (vision, cognition, motor function). Recommendations on evaluating these areas require validation. The CMA guide and SAFE DRIVE were overly broad in their recommendations. How best to detect cognitive impairment that could affect driving remains unclear.

CONCLUSION Office-based approaches to identifying older drivers who are either unsafe to drive or require more extensive evaluation need to be validated.

RÉSUMÉ

OBJECTIF Passer en revue trois approches proposées pour l'évaluation au bureau des conducteurs âgés et pour examiner les recommandations concernant la démence et la conduite automobile.

QUALITÉ DES PREUVES Le *Physician's Guide to Assessing and Counseling Older Drivers* de l'American Medical Association (AMA) formule des recommandations pour l'évaluation au bureau de l'aptitude à conduire des personnes âgées. Les autres stratégies examinées sont tirées de la sixième édition de *Determining Medical Fitness to Drive*, une publication de l'Association médicale canadienne (AMC), et de SAFE DRIVE. On a aussi passé en revue les recommandations de ces documents et d'autres sources concernant la démence et la conduite. Toutes les preuves étaient de niveau III.

PRINCIPAL MESSAGE Le document de l'AMA suggère des façons utiles d'identifier les conducteurs à risque et précise les domaines fonctionnels clés à évaluer (vision, cognition, motricité). Les recommandations sur la façon d'évaluer ces domaines devront toutefois être validées. Les recommandations du guide de l'AMC et de SAFE DRIVE sont jugées trop générales. Ainsi, la façon de bien identifier les déficits cognitifs susceptibles d'affecter la conduite n'y est pas précisée.

CONCLUSION Les stratégies proposées pour l'identification au bureau des conducteurs âgés qui présentent un danger au volant ou qui requièrent une évaluation supplémentaire devront être validées.

This article has been peer reviewed.

Cet article a fait l'objet d'une évaluation externe.

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Case 1

In a province with mandatory medical examinations for older drivers, an 80-year-old woman requests a medical assessment of her driving abilities.

Case 2

A son calls and says, “Dad shouldn’t be driving,” and asks you to get his licence rescinded.

These simple scenarios raise complex challenges for physicians. The Canadian Medical Association’s (CMA’s) Office for Public Health states that safe driving requires a multi-dimensional approach that would include deterrent legislation, public awareness, and education. Physicians are expected to be able to assess their patients’ medical fitness to drive.

In this paper I provide background on driving and aging and review several sources of advice for physicians on office-based assessment of older drivers. I examine in detail the American Medical Association’s (AMA’s) *Physician’s Guide to Assessing and Counseling Older Drivers*¹ because it seems the best guide available. Finally, I look at the issue of dementia and driving. Dementia, a common condition in older patients, can adversely affect ability to drive.

Quality of evidence

Information for this review came from papers, monographs, and books largely selected from my files. Additional references were obtained from MEDLINE searches using the text words “guide,” “guideline,” “physician,” “assessment,” “driving,” and “older driver” in various combinations. Other papers and reports were identified from the reference lists of these publications. The *Physician’s Guide to Assessing and*

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*Counseling Older Drivers*¹ was chosen for detailed examination because it is a recent and comprehensive review of the specific topic. In contrast to other sources of advice for physicians, it provides specific recommendations on what should be done.

Background

In 1996-1997, approximately 60% of Canadians older than 65 years in private households held valid drivers’ licences.² More men (77%) than women (45%) had licences. In both absolute and relative terms, we expect seniors to make up a growing segment of the driving population.² The safety record of older drivers is mixed. They are less likely to be involved in motor vehicle crashes (MVCs) than any other age group, but they typically drive fewer miles each year than younger drivers.³ After controlling for mileage driven, older drivers have a higher rate of MVCs than any other age group except for those younger than 24.³ When they are involved in MVCs, older drivers are more likely to be seriously injured or to die.^{2,3}

Driving is a complex activity. A hierarchy of skills is required for safe driving: operational (the basic motor, sensory or perceptual, and cognitive capabilities required to control a vehicle), tactical (choice of speed and distance kept from the car in front), and strategic (planning or preparing for trips). Office-based evaluations directly assess only operational skills. Tactical and strategic skills, though, are vital to understanding how older drivers compensate for declining operational skills.

Operational skills typically decline because of aging itself, chronic diseases, medication use, or a combination of these factors. Older drivers can avoid accidents by compensatory mechanisms.⁴ Whether older drivers should be subjected to more stringent licensing requirements than younger drivers is controversial.^{5,6}

Approach to assessment of older drivers

Two years ago, the AMA produced a 223-page document entitled *Physician’s Guide to Assessing and*

*Counseling Older Drivers.*¹ Information on how to obtain a copy of the guide can be found at www.ama-assn.org/go/olderdrivers. This comprehensive document includes an overview of medical conditions and medications that might impair driving, advice on pertinent legal and ethical issues, state-specific licensing requirements, and handouts for patients and families.

Advice on how to identify older patients at increased risk of medically impaired driving is given. Physicians are told to observe their patients for evidence of declining self-care skills (poor hygiene or grooming), mobility (difficulty with transfers and walking), vision, and

cognition. A list of “red flags” is given and is shown in **Table 1**. Some items on the list (eg, uncontrolled seizures) would in themselves lead physicians to recommend restricting, if not stopping, driving.

Driving concerns raised by patients or their families are particularly important. Older patients can be referred to a self-assessment questionnaire (patient handout) entitled “Am I a Safe Driver?” (**Figure 1**).¹ They rarely give information about their driving voluntarily. As Dave Barry wrote, “The one thing that unites all human beings ... is that deep down inside, we all believe that we are above average drivers.”⁷ Families are more likely to raise concerns. If an observation or presence of a red flag suggests a problem, physicians are advised to ask about driving.

Table 1. Red flags for medically impaired driving

Acute events (acute myocardial infarction, acute stroke, other traumatic brain injury, syncope, vertigo, seizure, surgery, delirium): before hospital or emergency room discharge, patients should be counseled, as needed, about driving restrictions and further assessments
Concerns raised by patients or family members (if raised, explore nature of concerns)
Chronic medical conditions
<ul style="list-style-type: none"> • Conditions affecting vision (eg, cataracts, age-related macular degeneration, glaucoma, diabetic retinopathy, field restrictions) • Cardiovascular diseases (especially those associated with presyncope or syncope or cognitive deficits) • Neurologic diseases (eg, dementia, residual deficits from stroke) • Psychiatric diseases (eg, mood disorders, anxiety disorders, alcohol or substance abuse) • Metabolic diseases (especially diabetes) • Musculoskeletal conditions (eg, arthritis, foot abnormalities) • Chronic renal failure • Respiratory diseases (eg, chronic obstructive pulmonary disease, obstructive sleep apnea)
Medical conditions with unpredictable or episodic events: patients should be counseled not to drive when they have any of presyncope or syncope, angina, seizures, transient ischemic events, hypoglycemic attacks, sleep attacks, or cataplexy
Medications: anticholinergics, anticonvulsants, antidepressants, antiemetics, antihistamines, antihypertensives, antiparkinsonians, antipsychotics, benzodiazepines and other sedatives and anxiolytics, muscle relaxants, narcotics, stimulants
Review of systems (symptoms or conditions that could impair driving abilities): physicians should ask about fatigue, weakness, headache, head trauma, vision changes, vertigo, shortness of breath, chest pain, dyspnea on exertion, palpitations, loss of consciousness, muscle pain, joint stiffness and pain, decreased range of motion, faintness, seizures. Paralysis, tremors, loss of sensation or numbness or tingling, depression, anxiety, memory loss, confusion, psychosis, mania

Modified from Wang et al.¹

Figure 1. Patient education handout

AM I A SAFE DRIVER?

Check the box if the statement applies to you.

- I get lost while driving.
- My family and friends say they are worried about my driving.
- Other cars seem to appear out of nowhere.
- I have trouble seeing signs in time to respond to them.
- Other drivers drive too fast.
- Other drivers often honk at me.
- Driving stresses me out.
- After driving, I feel tired.
- I have had more “near misses” lately.
- Busy intersections bother me.
- Left-hand turns make me nervous.
- The glare from oncoming headlights bothers me.
- My medication makes me dizzy or drowsy.
- I have trouble turning the steering wheel.
- I have trouble pushing down on the gas pedal or brakes.
- I have trouble looking over my shoulders when I back up.
- I have been stopped by the police for my driving recently.
- People no longer accept rides from me.
- I do not like to drive at night.
- I have more trouble parking lately.

If any of the above statements applies to you, your safety might be at risk when you drive. Talk to your doctor about ways to improve your safety when you drive.

Adapted from Wang et al.¹

For acute events, chronic conditions with acute effects, or medications on the AMA list, drivers would generally receive counseling. Three key functions required for driving (vision, cognition, motor function) should be assessed if patients have chronic conditions or if concerns about driving have been raised. Detailed instructions for their evaluation are provided (Table 2¹). The authors make no claims that their approach directly assesses risk of MVCs, as it is an assessment of operational skills. When problems are found, patients undergo further diagnostic assessment, and treatment plans are developed. If deficits are not correctable, patients should be referred to driver rehabilitation specialists.

Evidence in the AMA guide is level III (opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert opinion). The approach outlined has not been studied to determine whether it actually decreases risks for seniors and others on the roads.

When specific assessment items (Table 2¹) are examined, concerns arise. Though acknowledged as important, both contrast sensitivity and accommodation to changes in illumination are excluded in the visual examination. The assessment of visual acuity is reasonable. One study found that mandated testing of visual acuity was associated with a modest but significant reduction in seniors' rate of fatal MVCs.⁸ The approach for detecting visual field defects is inadequate; quadrant finger counting has been shown to lack sensitivity.⁹ Two studies (only one published) found a modest association between poor performance on rapid-pace walking and at-fault crashes.¹⁰ Range of motion (ROM) and strength recommendations are based on existing American standards of practice. Scoring of ROM was purposely left vague because required ROMs vary with automobile design, the effect of limited ROM often depends on other functions, and problems identified would not automatically lead to driving restrictions but likely to further assessment.

Table 2. Recommendations for assessment of key functions

FUNCTION	MANEUVER	INTERPRETATION
Visual acuity	Snellen E chart: Used to test far visual acuity. Patient stands 7 m away wearing usual glasses or contact lenses. Patient is asked to read the smallest line possible with both eyes open. Acuity is the lowest full row successfully read.	Further assessment required if acuity is less than 20/40.
Visual fields	Fields are tested on each eye by confrontation. Examiner sits or stands 1 m in front of patient at eye level. Patient is asked to close right eye while examiner closes left eye. Both fixate on the other's nose. Examiner holds up a random number of fingers in the four quadrants and asks patient to state the number. Fingers are held slightly closer to the examiner. Process is repeated for the other eye.	Further assessment required if any defects detected.
Cognition	Trail-making part B involves connecting in alternating order numbers and letters randomly arranged on a page. Test is scored by overall time needed to complete connections accurately. Examiner points out and corrects errors as they occur (note: required form provided in guide). Clock-drawing test: Examiner gives patient a pencil and a blank piece of paper and asks patient to draw a clock showing all the numbers with the time set at 10 minutes after 11 o'clock.	Further assessment required if more than 180 seconds are required for completion. Further assessment required if any incorrect elements.
Motor function	Rapid-pace walking: Patient is asked to walk 3 m, turn, and come back as quickly as possible. Patient may use walking aid if one is normally used. Range of motion: Examiner tests active range of motion of selected joints (neck, fingers, shoulder, elbow, ankles). Strength: Examiner manually tests strength by asking patient to resist movements. Strength is graded 1-5. Right and left shoulders, wrists, hands, hips, and ankles are tested.	Further assessment required if more than 9 seconds are required for completion. Further assessment required if there is excessive pain, hesitation, or a very limited range of motion. Further assessment required if strength is less than 4/5 in either arm or right lower leg (if patient drives a vehicle with manual transmission, this applies to the left leg as well).

Adapted from Wang et al.¹

For assessing cognition, the AMA guide suggests routine use of Trail-Making Part B¹¹ (TM-B) and the clock-drawing test (CDT).¹² Many physicians are not trained to administer the TM-B, which requires a special form. One paper quoted as justifying inclusion of the TM-B stated that it was an ineffective screening tool for identifying high-risk older drivers.¹¹ The CDT and its scoring scheme were justified by an abstract¹² and a personal communication. While there is support for using a cognitive battery for screening,¹³⁻¹⁵ this particular grouping has not been studied.

The AMA guide does represent a step forward. Specific and practical recommendations are made for practising physicians, but little evidence underpins the recommended approach. I think there is insufficient evidence at this time to recommend either adoption or rejection of the office-based assessment approach proposed in the AMA guide.

Alternative approaches

The Canadian resource most commonly used for determining medical fitness to drive is the CMA's guide to the driver's examination.¹⁵ The 6th edition includes a two-page section (section 12) on "The aging driver"¹⁶ that states that the physiologic changes accompanying aging will eventually affect driving ability. Cognitive decline and multiple physical defects are emphasized as particular concerns. Physicians are advised to assess vision, hearing, slowing of perception, cognition, strength, and alcohol consumption and to look for signs of arthritis, chronic obstructive airway disease, arrhythmias, and adverse drug effects. During regular evaluations, physicians are advised to look for signs of impaired cognition and physical disability that might affect driving safety.

For cognition, the CMA guide recommends screening with the Mini-Mental State Examination (MMSE).¹⁶ Those scoring less than 24 are deemed ineligible to hold drivers' licences pending complete neurologic assessment. Who can do this assessment and what it should include are not stated. The main problem with the CMA guide is that it is too broad. Few specific recommendations are made on how to assess older drivers.

A mnemonic for assessing older drivers is SAFE DRIVE: Safety record, Attentional skills, Family report, Ethanol, Drugs, Reaction time, Intellectual impairment, Vision and visuospatial function, and Executive functions.¹⁷ Again, while key areas requiring evaluation are identified, little specific advice is given. Nonstandardized methods are suggested for assessment of attention skills, reaction time, and executive functioning. Visual acuity testing and using the MMSE and the CAGE questionnaire on alcohol use are mentioned as options for testing other domains.

Both the CMA guide and SAFE DRIVE program are based on level III evidence.

Dementia

The AMA guide says that diagnosis of dementia in itself would be insufficient grounds for losing driving privileges. When there are concerns, though, it recommends formal assessment of driving ability. Both the AMA and the CMA base their recommendations on conclusions from the Canadian Consensus Conference on Dementia.¹⁸

A Canadian review of driving and dementia states that the MMSE "is inadequate as a predictor of on-the-road driving performance because it was not designed to assess cognitive function with respect to driving."¹⁹ This criticism can be made of other brief cognitive measures, such as the TM-B and the CDT, also. Despite this reservation, the MMSE is the test most commonly used by Canadian geriatricians when assessing older drivers with dementia.²⁰ Once dementia is diagnosed, the authors say physicians should do further assessment that includes "visual perception, selective attention, judgment, insight, alcohol use and medications [and] obtain a client and family history of driving."¹⁹ How to assess these areas is unstated. If the evaluation raises concerns, referral for driving assessment is recommended.¹⁹ The authors thought that DriveABLE (available at <http://driveable.com/contact.htm>) was "the most effective driving evaluation to date ... in a population of older adults with dementia."

Use of a global measure, the Clinical Dementia Rating (CDR),²¹ has been recommended by two other groups who looked at dementia and driving.^{22,23} It takes about 40 minutes to collect the data required for the CDR if patients are not known well.^{21,24,25} Six domains are assessed (memory, orientation, judgment and problem solving, community affairs, home and hobbies, and personal care), and patients are rated as 0 (no dementia), 0.5 (questionable dementia), 1 (mild dementia), 2 (moderate), and 3 (severe).

The 1994 International Consensus Conference on Dementia and Driving concluded that, if driving posed imminent risk, demented patients should be reported to their licensing authorities.²² If there was no imminent risk but a patient's CDR was 2 or 3, physicians should recommend immediate cessation of driving. When dementia was mild (CDR 1) and patients stable from a functional standpoint, regular follow up was suggested. Where there was uncertainty, specialized assessment was thought necessary. No consensus could be reached by this group on a MMSE cutoff score. The American Academy of Neurology published a practice parameter on driving and Alzheimer disease that set a lower CDR threshold.²³ The Academy thought that Alzheimer patients with a CDR of 1 should not drive. Patients with possible Alzheimer disease and a CDR of 0.5 were thought to pose a serious risk, and were thought to need driving performance evaluation.

On-road tests

Some advocate use of on-road tests. The 1993 New South Wales, Australia, Roads and Traffic Authority's guidelines for medical practitioners suggest that drivers with dementia be referred for on-road assessment if their abilities are suspect.²⁶ Subsequently, an Australian geriatrician recommended that cognitive screening (possibly with a CDT) be done on all patients older than 70 who continue to drive and that all patients with dementia should refrain from driving.²⁷ An accompanying editorial disagreed with this draconian approach.²⁸ The authors of the editorial thought that, if unsafe driving behaviour had not been reported, an on-road test would be the most valid means of assessing

driving competence. This driving test should be standardized and designed for those with impaired cognition, include some complex traffic situations, and be widely available.

Little agreement

Various approaches, scales, and thresholds have been proposed. If dementia is present, some suggest arbitrary cessation of driving while others take a more selective approach. There is general agreement that, where there is uncertainty, further assessment is indicated.

Case scenarios

If we return to our two scenarios, mandatory assessment of the 80-year old woman in case 1 would be guided by provincial requirements. In my province (Alberta) you would complete the "Medical Examination for Motor Vehicle Operators" form and submit it to the Motor Vehicles Division of the Alberta Solicitor General. In case 2, you would have to clarify the son's concern and decide on appropriate evaluation, which should include assessment of cognition. For both patients, the list of red flags and the AMA-recommended approach could provide structure for the assessments.

Conclusion

Canadian physicians' practices in evaluating driving skills will be defined largely by provincial requirements and national standards.^{16,29} Physicians' assessment should be part of a comprehensive approach that includes ready access to valid and reliable performance-based assessments of driving skills. Office-based approaches to identifying older drivers who are either unsafe to drive or require more extensive evaluation need to be validated. ❁

Competing interests

None declared

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EDITOR'S KEY POINTS

- Driving is a complex activity requiring operational, tactical, and strategic skills. Family physicians can directly assess only operational skills.
- Family physicians can assess visual acuity, cognition, and motor function in their offices, but beyond these domains, testing by driving assessment specialists is likely more effective.
- The current most comprehensive guide is the American Medical Association's *Physician's Guide to Assessing and Counseling Older Drivers*. Its maneuvers and recommendations, however, are mostly based on level III evidence (ie, expert opinion).
- The Canadian Medical Association's guide to driver examination has only a two-page section on older drivers and offers few specific recommendations.

POINTS DE REPÈRE DU RÉDACTEUR

- La conduite automobile est une activité complexe qui requiert des habilités opérationnelles, tactiques et stratégiques. Les habilités opérationnelles sont les seules que le médecin de famille peut évaluer.
- Au bureau, le médecin de famille peut évaluer l'acuité visuelle, les fonctions cognitives et la motricité, mais en dehors de ces domaines, les spécialistes de l'évaluation de la conduite sont probablement plus efficaces.
- À l'heure actuelle, le guide le plus complet est le *Physician's Guide to Assessing and Counseling Older Drivers* de l'American Medical Association. Toutefois, les stratégies et recommandations qu'on y trouve reposent principalement sur des preuves de niveau III (c'est-à-dire sur des opinions d'experts).
- Le guide de l'examen des conducteurs de l'Association médicale canadienne n'a qu'une section de deux pages sur les conducteurs âgés et il contient peu de recommandations spécifiques.

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