

# Policy and Practices Updates

## Assessment of older drivers in New Zealand: The current system, research and recommendations

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*The purpose of this article is to clarify the current New Zealand driving licensing requirements for older adults and to provide practical recommendations for those health professionals who make decisions regarding driving ability in older adults. Health professionals involved in the assessment of older drivers were asked to clarify areas where more efficient use could be made of assessment resources. A review of driving literature was performed to find specific factors associated with increased risk of negative driving outcomes in older adults. Particular*

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*attention was paid to the suitability of different types of on-road assessment for certain patient groups, the effect of specific diseases and medications on driving safety, and the effect of cognitive impairment. A list of seven recommendations were compiled which include a focus on appropriate on-road driving assessment referral, driver refresher courses, cognitive screening for those presenting for licence renewal and sensitive broaching of the topic of driving cessation.*

**Key words:** aged, automobile driving, health planning, licensure, risk assessment.

### Introduction

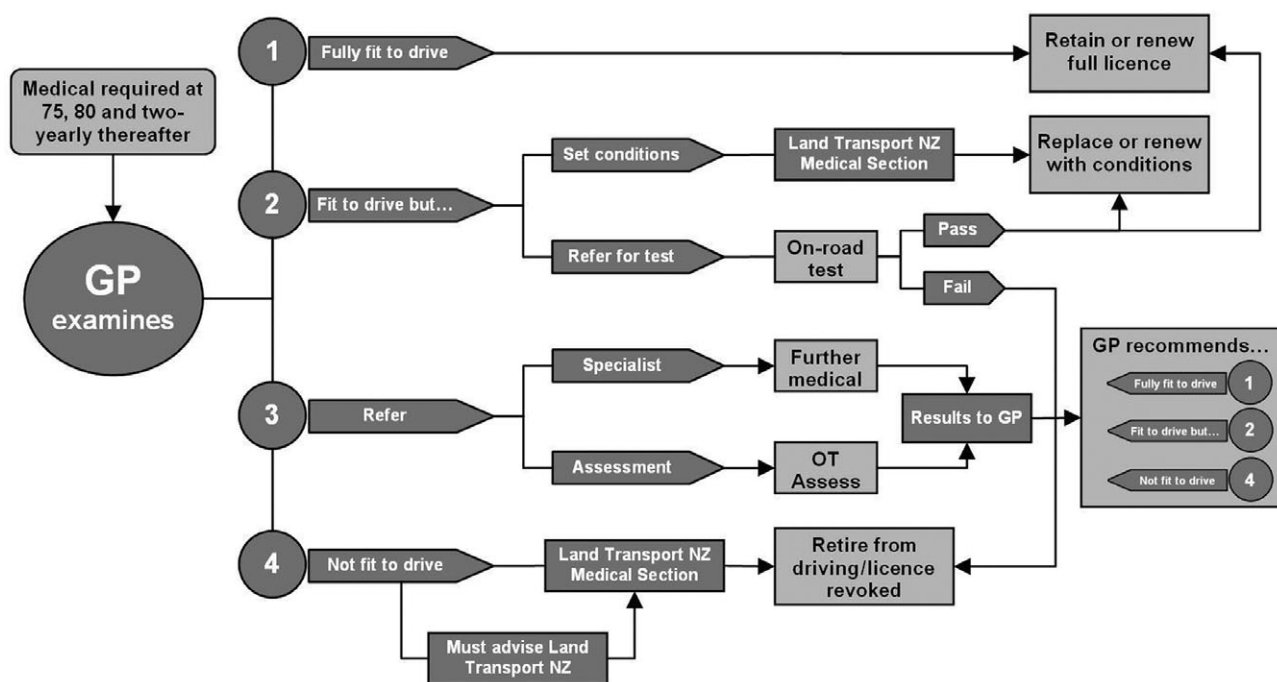
This article is a collaborative effort between researchers, driving specialist occupational therapists (OTs), an old-age psychiatrist and a general practitioner (GP) representative to clarify the current older driver relicensing requirements in New Zealand, to provide accurate summaries of international research investigating risk factors for unsafe driving in older people, and to provide concrete recommendations for how GPs and other health professionals charged with assessing driving ability can make the best use of time and resources to detect those older drivers who are at increased risk for unsafe driving.

### Driving assessment in New Zealand

Up until December 2006, New Zealand drivers aged 80 and over were required to sit biennial on-road driving assessments in order to retain their drivers licence. This policy was ended in 2006 because of accusations that it was ageist. Drivers are now required to obtain a 'medical fitness to drive' certificate from their GPs at ages 75, 80 and biennially thereafter. A guide exists for medical practitioners, optometrists and OTs for assessing medical fitness to drive [1]. The guide is not specific to older drivers but has sections on medical illnesses more common in older people. A fact sheet related to older driver relicensing is available on the New Zealand Transport Agency's (NZTA; formerly Land Transport New Zealand) website (<http://www.nzta.govt.nz/resources/factsheets/57/older-drivers-licence-renewal.html>). The NZTA provided a flow chart for GPs in 2006 detailing the steps involved in older driver licence renewal (Figure 1).

The chart depicts four decision pathways. The most direct options (1 and 4) are for a GP to decide independently whether a patient is medically fit to drive and to recommend this unconditionally. These options should be used when the GP is satisfied that their patient is fit to drive (Option 1), or

**Figure 1: Flowchart of the older driver licence renewal system (Reproduced with permission from the New Zealand Transport Agency (NZTA) and adapted from the NZTA information pack for GPs of December 2006)**



when there is obvious impairment such as moderate to severe dementia or levels of visual acuity that do not meet NZTA minimum requirements (Option 4). Option 2 has two sub-options. The first is for the GP to supply a medical fitness to drive certificate with set conditions added to the licence, such as must wear corrective lenses, distance restrictions or daytime-only restrictions, although there is no evidence that these latter two conditions reduce on-road errors and crashes.

The second sub-option is for the GP to supply a medical fitness to drive certificate subject to the patient satisfactorily undertaking an On-road Safety Test. If the patient fails that test, this information is forwarded to NZTA who make a decision regarding renewal of the patient's licence.

Option 3 is an intermediate step for when the GP considers a diagnosed or suspected medical illness may be affecting driving safety. In this case, a GP can refer their patient to a medical specialist (e.g. neurologist, geriatrician, psychiatrist, optometrist), or to an OT who can perform a Medical Driving Assessment. On receipt of the specialist assessment results, the GP follows flowchart options 1, 2 or 4. The NZTA state in their GP information pack (August 2006) that a patient who has received a favourable report following a Medical Driving Assessment performed by an OT should not be referred for an On-road Safety Test because the Medical Driving Assessment is a more thorough investigation of a person's ability to drive. If a GP decides that their patient is not fit to drive, they should inform the

patient and ask them to cease driving immediately. Only a medical practitioner is able to sign a medical certificate (DL9), or a registered optometrist to sign an eyesight certificate (DL12), stating that an appropriate examination has been undertaken and that a patient is considered medically fit to renew their licence. Specialist assessors and OTs may also supply recommendations directly to the NZTA, who ultimately make the legal decision to retain or remove driving privileges.

General practitioners must determine not only a patient's medical fitness to drive but also their ability to drive safely. The LTNZ website states: 'If your doctor thinks you are medically fit to drive, but is unsure about your ability to drive safely, he or she may issue you with a Medical certificate for driver licence enabling you to renew your driver licence provided you pass an On-road Safety Test with a testing officer' [2]. Medical fitness to drive indicates either that there is no medical disorder or that if there is, and if it has the potential to affect driving, it is not doing so in a particular individual. Ability to drive safely includes a person's knowledge and on-road application of road rules and competent driving behaviour, and can be independent of a medical condition. We contend that determining ability to drive safely can only be performed following the observation of actual driving behaviour and is, thus, almost impossible to do in a GP clinic, unless there is reliable information attesting to a person exhibiting unsafe driving behaviour. Determining ability to drive safely may be one of the hardest decisions GPs are asked to make regarding driving ability in older drivers,

particularly because a person does not have to be medically unwell to display unsafe driving behaviour.

The On-road Safety Test and the Medical Driving Assessment are discussed below (specialist assessments by optometrists are not considered in this article). Suggestions for selecting which assessment to refer a patient to are provided in the recommendations section of this article.

The On-road Safety Test is a 30-minute on-road assessment essentially identical to the previous compulsory Older Driver Test. On-road Safety Tests are provided by the New Zealand Automobile Association, Vehicle Testing New Zealand and Vehicle Inspection New Zealand. The test assesses basic driving skills (e.g. leaving the kerb, turning left at an intersection), hazard detection (e.g. negotiating a crossroad, stopping or giving way at Stop or Give Way signs) and more complex driving situations (e.g. turning right at a crossroad in medium-to-heavy traffic in a 50 km/hour zone). Scoring is based on the performance of predetermined manoeuvres, with error scores weighted and combined to give an ultimate pass or fail score. This test is less comprehensive and shorter in duration than the New Zealand full-licence practical test for novice drivers.

Medical Driving Assessments are performed by OTs with specialist training in driver assessment. There are few medical conditions which are automatic rule-outs for driving licensure. Medical illnesses that affect driving usually do so unpredictably. Medical Driving Assessments do not make use of predetermined lists of errors with weighted scores, unlike the On-road Safety Test, but are considered by NZTA to be a more comprehensive assessment of driving ability than the On-road Safety Test. A Medical Driving Assessment fulfils requirements for assessing both a person's medical fitness to drive and their ability to drive safely. The on-road component of an assessment averages around 45 minutes in length and spans a wide range of on-road driving situations (e.g. different speed zones, single- and multi-laned roads, moving from quieter to more busy roads). OTs assess aspects such as awareness of the road and traffic environment, apparent insight into the driving task and any errors that occur, and whether people are able to compensate for difficulties posed by their medical condition. Stringent observance of all road rules is not the primary focus; people are asked to drive as they normally would. The objective is not to penalise people for driving errors commonly performed by many drivers, but rather to determine whether a medical illness has made the person unable to drive safely. An OT assessment of driver safety is based on a combination of outcomes of on-road assessment, cognitive and physical evaluations, and any information gathered from a person including, but not limited to, driving history and frequency, self-imposed limitations, and orientation to time and place. A specialist OT assessment includes consideration of whether driving instruction or modification to a vehicle could improve performance to safe standards; this is not provided by the On-road Safety Test.

Before the abolition of compulsory on-road assessment for older drivers in December 2006, a New Zealand study investigated the association between the outcome of the compulsory Older Driver Test and involvement in a subsequent fatal or injury-causing crash over a 2-year period in over 39 000 drivers aged 80 and above [3]. The previous testing system stipulated no limit to the number of times drivers could resit the compulsory test in order to secure a pass. Seventy-eight percent of the study sample passed the assessment on the first administration, and 17% passed following two or more tests (two drivers passed the test on the 10th resit). The remaining 5% of drivers took at least one test and never received a passing grade. The number of drivers who decided to relinquish their licence rather than submit to a test is unknown.

Keall and Frith [3] found that for every time the older Driver Test was repeated in order to secure a pass, the risk of being involved in an injury-causing crash increased by 33%. In reality, however, the number of people involved in serious crashes was small in both groups – 223 in 32 135 first-time passers, versus 80 in 6863 who passed after two or more attempts. Presumably, the crash rate of those who never passed the on-road assessment would have been higher than in these two groups in which a pass was obtained, but their crash rate is unknown as a fail outcome equated to a loss of licence and supposed driving abstinence. This difficulty applies to all studies of on-road driving assessments and is a major obstacle in assessing their reliability and validity. Obviously allowing drivers considered 'unsafe' to continue driving in order to monitor their performance has ethical implications. Notwithstanding, we have performed a 2-year follow-up of 60 older drivers who failed a single on-road driving assessment and who were allowed to continue driving (participants had no neurological diagnosis and had not been referred for assessment). Results at 1-year follow-up showed no trends for higher self- or police-reported crashes or traffic offences in the fail group compared with the pass group (15 failed and 43 passed) [4].

An impediment to the access of on-road driving assessments in New Zealand is that only a small number are publicly funded in only a few regions. An OT-administered driving assessment performed privately can cost as much as \$NZ600. In contrast, an On-road Safety Test costs only \$NZ41 (following a \$NZ7.90 government subsidy), although it cannot evaluate the effects of medical conditions on driving behaviour. The substantial cost of private specialist driving assessment may dissuade GPs from referring their older patients for a Medical Driving Assessment. Thus, increased availability of publicly funded Medical Driving Assessments deserves consideration by health boards. Also, the current system for dealing with a Fail on the On-road Safety Test as depicted in Figure 1 is for NZTA to revoke a person's licence. As cited above, 17% of older drivers who initially failed the older Driver Test passed on subsequent sittings – albeit with a small increase in the number of serious crash incidences in those who repeated the test [3]. We there-

fore suggest that GPs strongly encourage their patients to attend a driver refresher course prior to taking the On-road Safety Test in order to maximise the likelihood that safe drivers will pass the test on a single administration. Details on driver refresher courses are contained in the recommendations section below.

### Risk factors for decreased driving safety of older drivers

By distance driven, drivers aged 60 and above have increased injury and death rates compared with middle-aged drivers (Figure 2) [5–8]. A higher burden of traffic-related morbidity in older population is therefore expected in future because of the increasing proportion of older people in society in the coming decades.

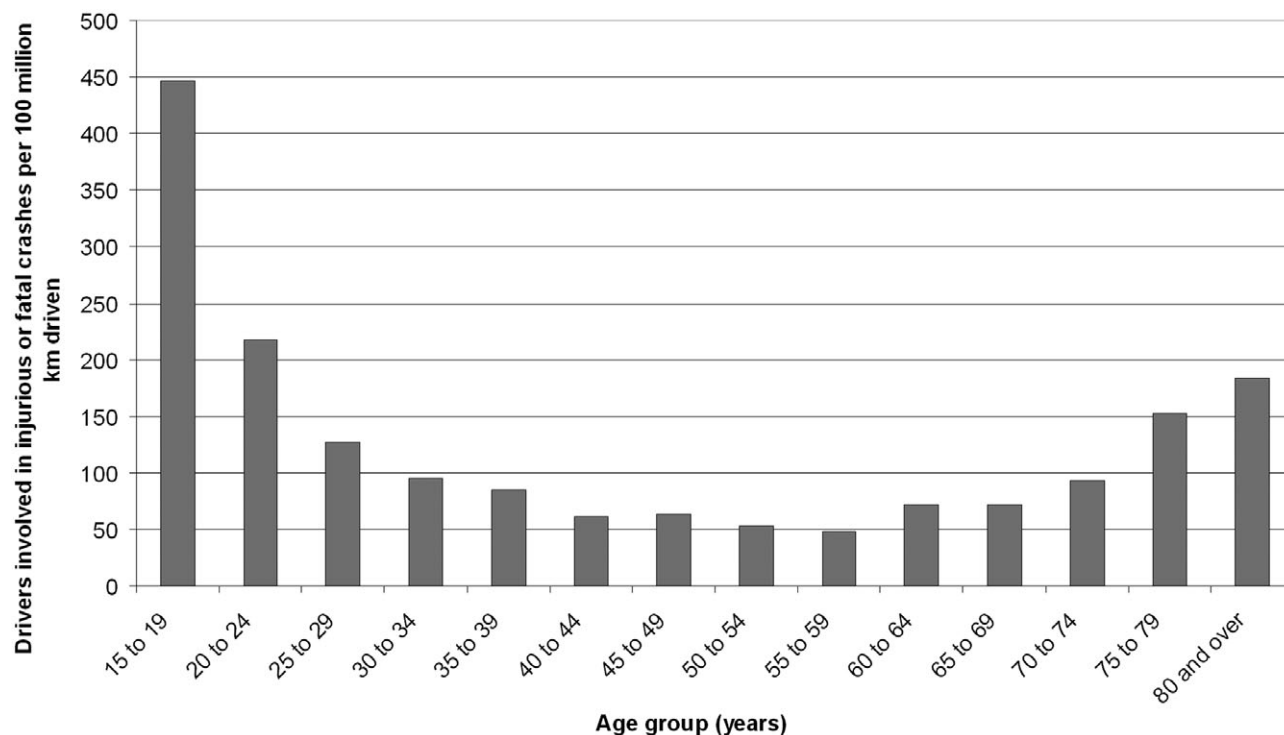
Older drivers are more physically fragile than younger ones. Their death and injury rates are thus inflated by accidents that would not lead to injury or death in younger drivers [9–11]. Annual distance driven in older age groups is substantially lower than that among middle-aged drivers. These biases are minimised when it is shown that older adults' higher injury and death rates persist when statistics are adjusted for the number of driving trips and for increased physical fragility [5].

Factors linked to unsafe driving in older adults include heart disease, cerebrovascular disease, poor visual attention and mental flexibility, age-related cognitive decline, and dementia [11–18]. Medications associated with poorer driving or

crashes include hypnotics, non-steroidal anti-inflammatories, angiotensin converting enzyme inhibitors, anticoagulants, benzodiazepines, tricyclic antidepressants and lithium [17,19–22]. The effect of haloperidol on driving has not been specifically investigated in older adults but it has been associated with poorer driving-related psychomotor performance in younger drivers. Compared with haloperidol, atypical antipsychotics are associated with fewer psychomotor problems [23,24]. Although there have been few studies, sodium valproate and carbamazepine have not been shown to have a consistent association with increased crash risk [21,25]. A recent review of older drivers concluded that tricyclic antidepressant doses should be introduced gradually, their negative effects on driving being most likely to occur in the first week of taking a tricyclic, and that more severe depressive symptoms may also negatively affect driving [19]. Unfortunately, the interaction effects of multiple medications on driving safety, especially in older adults, has not been studied. Antidepressants prescribed along with sedating medications such as benzodiazepines may have an adverse synergistic effect. For example, fluoxetine prescribed to a patient already on alprazolam may increase benzodiazepine side effects such as psychomotor impairment through effects on the cytochrome P-450 2D6 enzyme [19]. The Medical Aspects of Fitness to Drive guidebook has lists of medications that should be considered in relation to medical fitness to drive [1].

As a group, drivers with dementia have crash rates 2.5 to 10.7 times higher than those without dementia [14,26].

**Figure 2: Number of New Zealand drivers per age group involved in injury and fatality crashes per 100 million km driven. Data obtained from the Household Travel Survey [6].**



Studies of dementia prevalence have reported rates between 13% and 43% in the 80 to 89 age group, increasing exponentially per year within this age range, and between 40% to 65% in those aged over 90 [27–29]. Many people with early dementia may pass an on-road driving assessment [30] but there are as yet no reliable neuropsychological or demographic variables that can discriminate between individuals who pass and fail. Even if a driver with dementia is judged to be safe, driver reassessment will need to recur for as long as the patient continues to drive. Fox et al. [31] found that of seven drivers with dementia who passed an on-road driving assessment, only three passed a second assessment 6 months later. Other researchers have also suggested that drivers with dementia should be assessed on-road every 6 months [32,33].

In New Zealand, a computerised test battery of Sensory-motor and Cognitive Tests (*SMCTests™* – [http://www.neurotech.org.nz/files/CanDAT\\_SMCTests\\_User\\_Manual.pdf](http://www.neurotech.org.nz/files/CanDAT_SMCTests_User_Manual.pdf)) [34,35] is currently being used in several occupational therapy settings as part of comprehensive assessment of people with brain disorders [35]. A study is underway to determine whether a subset of tests in this computerised battery, or standard neuropsychological tests, can detect which drivers with Alzheimer's type dementia or mild cognitive impairment will fail an on-road driving assessment. However, no current off-road driving assessment methods have high enough levels of sensitivity and specificity for detecting unsafe driving in order to be relied on solely [36].

Driving is important for older people, as cessation is related to decreases in social participation [37,38], decreases in physical health [37], increases in depression [39] and increased mortality [40]. Although drivers aged 60 and above have increased rates of serious injury and death on the road per km driven, Evans [41] reported that per-person per-year a 70-year-old male driver poses 40% less threat to other road users than a 40-year-old male driver. A 20-year-old male driver poses a 196% greater threat to other road users than that posed by a 70-year-old male driver. This is due to the considerably lower mileage driven by older drivers which reduces their overall exposure to the risk of a crash. Because of the negative consequences of driving cessation for older adults, it is imperative that people are able to retain their licences for as long as they are able to drive safely.

The most difficult step to take in determining driver fitness is focusing on an individual's deficits and abilities, which are not easily identified from studies that have focused on group differences between safe and unsafe driver groups. Hence, pragmatic decisions made by expert driving assessors will continue to be part of the assessment of safe driving in older adults.

### Recommendations for making decisions about driving for older adults

While recognising regional difficulties in availability of specialist driving services, we propose several recommendations

to health practitioners to assist their decisions about driving for older adult patients. These suggestions are based on the driving research literature, our professional opinion and the currently required procedure for renewing the licences of older New Zealand drivers.

#### Choosing an on-road assessment

The two on-road driving assessments available (On-road Safety Test and Medical Driving Assessment) are designed for different patient groups. If a general medical condition has been diagnosed and the GP has concerns that the condition may affect driving safety, a Medical Driving Assessment is recommended, particularly if the medical condition is neurological or neuropsychiatric (e.g. dementia). Alternatively, if a patient has no diagnosed medical condition thought likely to affect driving and yet the GP is seriously concerned about their ability to drive safely, they should be referred for an On-road Safety Test.

Not everyone with a neuropsychiatric condition requires a Medical Driving Assessment. For example, nearly everyone with a stable anxiety or depressive disorder is capable of continuing to drive safely. When medical contributions to fitness to drive have made a significant effect, it is important to treat and improve these conditions as much as possible, and OTs who perform Medical Driving Assessments may be able to offer remediation and recommendations to assist a person to regain a safe driving status.

#### Driver refresher courses and the On-road Safety Test

To provide the best chance that an older driver will pass the On-road Safety Test, a GP should strongly encourage a driving refresher course prior to taking the test. A recent review article concluded that education interventions combined with an on-road driving component are successful in increasing driving knowledge and driving-specific skills in older people [42]. Unfortunately, the New Zealand Safe with Age older driver education course was cancelled in August 2009. While a new older driver education programme is being planned for implementation over the next few years, there is currently no publicly funded course available. The Automobile Association and other private driving schools provide older driver refresher courses.

#### Cognitive impairment and driving

Because of the high prevalence of cognitive impairment in the age groups for whom mandatory driving fitness certification is required, GPs should screen their patients for cognitive decline when they present for a medical fitness to drive certificate. Illnesses associated with cognitive impairment include the various dementias, Parkinson's disease, multiple sclerosis, stroke and depression. An initial evaluation seeks evidence for a recent history of cognitive decline from the patient or preferably a reliable informant, observing cognitive function during the interview, and also using a formal screening test. Patients screened as positive for cognitive impairment require a thorough diagnostic evaluation. Fol-

lowing diagnosis, a global management plan should be constructed that includes, but is not limited to, driving.

Patients with diagnosed progressive dementia may be, or will at some point become, unsafe drivers. In general, few people with moderate to severe dementia pass on-road assessments, but as many as half of drivers with very mild to mild dementia can pass an on-road assessment [30,43]. At least six monthly assessments are reasonable for those who continue to drive – the compulsory 2-year Medical Driving Assessments are too infrequent for monitoring the effect of dementia on driving. Driving fitness certificates can be issued for this shorter time to ensure reviews continue. The threshold for requesting on-road or specialist assessments should be low. Discussions regarding cessation of driving and alternative arrangements for transportation are best had when the patient is still capable of making effective decisions. A caregiver's rating of a patient's driving ability as marginal or unsafe has been shown to be related to adverse on-road outcomes, but patient's self-ratings of driving ability are not [43]. Fitness to drive should also be assessed after any introduction or increase in dose of medications that may increase risk in people with cognitive impairment. With respect to dementia, a recent review provided an algorithm for evaluating the risk of adverse driving events, based on a Clinical Dementia Rating and driving behaviour questionnaires [43].

#### Formal cognitive testing and driving

The NZTA offers a short test of road sign recognition in the Medical Aspects of Fitness to Drive [1] manual to use with people who may be suspected of having dementia. As there has been no research to assess the validity of this test, GPs are advised instead to use standardised and validated assessment measures to identify cognitive impairment coupled with pragmatic history-taking for driving ability. A popular screening test for significant cognitive impairment is the Mini Mental State Exam (MMSE) [44]. GPs should be aware that this test is not sensitive enough to detect mild cognitive impairment, but obtaining a score of 25/30 or below on the MMSE may indicate the presence of cognitive impairment such as from a dementia (the test is more specific than it is sensitive) [45,46]. A standardised version of the MMSE (the SMMSE) [47,48] is available at no cost from the Van der Veer Institute for Parkinson's and Brain Research (<http://www.vanderveer.org.nz/files/SMMSE.pdf>). The original article provides further guidance on administration [48]. A more sensitive screen for mild cognitive impairment and mild dementia is the Montreal Cognitive Assessment [49], available online (<http://www.mocatest.org/>).

#### Driving risk history assessment

The absence of recent crashes and traffic offences does not necessarily mean that a person is a safe driver. Crashes are low base-rate occurrences, even for impaired drivers, and other road users are often able to avoid unsafe drivers. Inquiring about 'discussions' with police officers, whether or

not an infringement notice was administered, or whether other drivers have been complaining about the driver's behaviour may provide useful information. Assessing the car for damage can also be informative. In a document titled 'Supporting older drivers' [50], the NZTA specifically advises family members to contact a person's doctor if they are concerned about safety risks. Reports of deterioration in driving ability can be elicited, although family members are sometimes reluctant to talk about the issue, particularly in the presence of the affected family member. It is important to remember that holding a driver licence is a privilege and not a right. The Privacy Act 1993 states that 'disclosure of personal information may be necessary to prevent or lessen a serious and imminent threat to: (i) public health or public safety or (ii) the life and health of the individual concerned or another individual'. This enables GPs to investigate potentially serious driving problems.

#### Vision assessment

It is also helpful for drivers referred for driving assessments to be first screened for meeting NZTA minimum requirements for visual field (140°) and visual acuity (6/12 binocular) [1]. Referral to an optometrist should be considered if a patient does not meet these standards.

#### Driving cessation

When a person must immediately cease driving, common sense actions and the assistance of the police may be required. Family or supporters will need to take responsibility for access to car keys, disabling or removing a vehicle in some situations. When assessment of driving is delayed, driving may need to cease in the interim. Many people benefit from making a ritual out of making the important decision to cease driving. Facilitating patients with impaired driving ability to surrender their licences at their local police station can be a helpful step in the grieving of one's ability to drive. Informal management of driving cessation is preferred but the threshold for formal reporting to the NZTA and/or police, depending upon urgency, must be low. Assessing patients 6 months post driving cessation to monitor the use of alternate transport is warranted. The health of older people (mental and physical) is threatened by social isolation and many New Zealanders live in areas in which social engagement is predicated upon an ability to travel.

#### Acknowledgements

*This article has received no specific financial support. It was written during the lead author's PhD project on driving ability in healthy older adults and persons with Alzheimer's dementia. The empirical studies for the PhD project received funding from the Transport Research and Educational Trust Board, Accident Compensation Corporation, Christchurch Neurotechnology Research Programme and University of Canterbury.*

## Key Points

- A range of physical and cognitive disorders as well as medications have been associated with increased risk of unsafe driving in older drivers.
- General practitioners and health professionals should actively screen for cognitive impairment in older drivers presenting for licence renewal.
- On-road driving assessments should only be requested for those older drivers who present with risk factors for unsafe driving, or for whom there is reliable evidence of unsafe driving behaviour.

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