

ROAD SAFETY IMPACT OF MEDICAL TESTING OF DRIVERS

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1 A BRIEF STATEMENT OF THE ISSUE

There are many medical conditions which can be at least intuitively associated with a decline in driving performance and thus crash risk. To this end, most countries have some form of medical assessment in place, usually as a pre-condition for either initial or renewed licensing (Vernon et al. 2001).

However, the extent to which these assessment programs are effective in identifying unsafe drivers is unknown.

2 AN ASSESSMENT OF THE ROAD SAFETY ISSUE

Driving a motor vehicle is a complex task, requiring the successful integration of a range of functions including perception, attention, judgement, response time and reasonable physical endurance. Hence it would be reasonable to assume that medical conditions, and in some cases treatments, affecting functional capabilities (sensory, motor or cognitive functioning) would play a contributory role in crash risk (Austroads 2003). Quantifying this association however is not possible from standard crash reports as it is difficult for the police to determine when a medical condition is present, and how or if this condition is related to the crash (Land Transport Safety Authority 2002).

Even if a medical condition does not directly 'cause' a crash, it may undermine the individual's ability to react appropriately and effectively when faced with a hazardous situation (Janke 1993). Waller (1977) notes that even when impairment is sub-clinical or minimal, the individual has less spare capacity to deal with challenges when an environmental task becomes unusually demanding. He further estimates that medical conditions play a contributory role either alone or in conjunction with other factors, in 15 to 25% of all crashes.

Australia (and most other Western societies) faces the challenges of an ageing population. It is estimated that by the year 2030 one in four persons in many OECD countries will be aged 65 or over (OECD Expert Group 2001). With advancing age there is an increased likelihood of medical conditions (and associated functional impairments). Therefore it can be reasonably assumed that the impact of medical conditions on driving is likely to intensify in the near future.

There are therefore road safety benefits in identifying medically impaired and at-risk drivers, if the assessment process can be effectively implemented.

3 CURRENT POLICIES AND PRACTICES IN AUSTRALASIAN JURISDICTIONS

While there are no uniform standards governing medical assessment as a pre-condition for licensing in Australia or New Zealand, there is some consistency across jurisdictions.

Firstly, many jurisdictions have a self-assessment health section to be completed when renewing licences. Some individual differences notwithstanding, there is a substantial commonality in the data sought.

Secondly, the Austroads *Assessing Fitness to Drive* guidelines (Austroads 2003) have been recommended to all Australian jurisdictions as the basis for assessing medical fitness to drive. New Zealand has a closely related document, *Medical Aspects of Fitness to Drive* (Land Transport Safety Authority 2002).

Thirdly, the National Road Transport Commission (2000) has laid down the following administrative guidelines with which all Australian jurisdictions must comply. In particular:

- The holder of a driver licence must, as soon as practicable, notify the licensing authority of any permanent or long term injury or illness that may impair his or her ability to drive safely.
- Any applicant for a driver licence may be required to undergo a medical examination or attend a specified medical practitioner or allied professional practitioner for examination, or produce evidence of compliance with medical standards.

Table 3.1 outlines the different jurisdictions' policies concerning medical assessment.

Table 3.1: Medical assessment requirements in Australasian jurisdictions

State	Is a medical assessment required prior to initial licensing?	Is a further medical report required during the period of licensing?	Are there additional road test requirements?
NSW	Vision test required. Medical test only if initiated by GP, recommended basis being <i>Assessing Fitness to Drive guidelines</i> .	Vision test required at each renewal and replacement. Further medical reports when deemed necessary by GP or others. All aged 80 years and over require visual and medical reports annually.	At the recommendation of GP or Police. Annually for those 85 years and older.
VIC	Vision test required. Medical test only if initiated by GP, recommended basis being <i>Assessing Fitness to Drive guidelines</i> .	Medical reports required when deemed necessary by GP or others. Submitted medical reports more than 6 months old not accepted. Non-progressive conditions exempt from reassessment. No age-related medicals required. Vision test required when a visual condition is declared or reported.	As and when GP determines it to be necessary.
QLD	Vision test only required if applicant declares he/she has an impairment. Medical test only if initiated by	A person must obtain a current medical certificate if they have a medical or physical incapacity that may affect their driving or	As and when GP determines it to be necessary.

State	Is a medical assessment required prior to initial licensing?	Is a further medical report required during the period of licensing?	Are there additional road test requirements?
	GP, recommended basis being <i>Assessing Fitness to Drive guidelines</i> .	are 75 years of age or older. Currency of certificate is determined by the doctor.	
WA	Vision test required. Medical may also be required if the licence applicant declares a medical condition on the application form. Medical test only if initiated by GP, recommended basis being <i>Assessing Fitness to Drive guidelines</i> .	When deemed necessary by GP or others. Medical and vision reports required from those aged 75 and 78, and are required annually from those aged 80 years. May be required to have a further assessment if endorsed to carry passengers for 'hire or reward'.	When recommended by a GP, or when medical conditions or convictions suggest driving ability is compromised. Age 85 years then annually.
SA	No vision test required (unless applicant declares a condition. In addition, under the <i>Motor Vehicles Act</i> a GP or optician must refer anyone that they believe requires a vision test). Medical test only if initiated by GP, recommended basis being <i>Assessing Fitness to Drive guidelines</i> .	When deemed necessary by GP or others. Following an accident where the police suspect a medical condition, an assessment must be carried out. Medical and vision tests required annually for those aged 70 years and over.	When recommended by a GP, may be required following head injury or stroke.
TAS	Vision test required. Medical test only if initiated by GP, recommended basis being <i>Assessing Fitness to Drive guidelines</i> .	When deemed necessary by GP or others. Those aged 75 years and over are required to provide medical and vision reports annually.	When recommended by a GP, when a police or concerned citizen report is filed, where a progressive disease (e.g. Multiple Sclerosis) is present and annually from 85 years.
ACT	Vision test required. Medical test only if initiated by GP, recommended basis being <i>Assessing Fitness to Drive guidelines</i> .	When deemed necessary by GP or others – specialist report where required. Certain conditions require annual assessment from date of first report. Vision test required 5 yearly from age 50, and annually from age 75. All aged 75 and over need medical reports annually.	As and when GP determines it to be necessary.
NT	Vision test required. Medical test only if initiated by GP, recommended basis being <i>Assessing Fitness to Drive guidelines</i> .	Vision test required 5 yearly while holding a licence. Medical reports required when deemed necessary by GP or others. No age requirement for medical or visual assessment.	Road test only on the advice of a health professional
NZ	Vision test required.	Medical report required when deemed necessary by GP or others. Medical certificate (including vision test) required from those aged 75, 80 and every second year thereafter.	Only when deemed necessary.

It may be seen that the onus of determining fitness to drive is most commonly placed upon general practitioners. However, the various guidelines notwithstanding, for most drivers determining fitness to drive remains essentially a subjective judgement.

4 A REVIEW OF THE RESEARCH

4.1 Are medical conditions a road safety issue?

A review of medical conditions and their possible association with crash risk led to the conclusion that certain conditions significantly impair driving abilities and increase crash risk for at least a proportion of drivers (Dobbs 2005).

Other research has also highlighted the role of medical conditions in crash involvement (Vernon et al. 2001). The state of Utah requires that at licence renewal, each driver report whether he or she has a medical condition: during 1992-96, almost 2 million drivers renewed their licences, with almost 70,000 (4%) reporting at least one medical condition. Ninety four percent of drivers with a self-reported medical condition continued to hold a full, unrestricted driving licence.

Compared to fully-licensed drivers without reported conditions, fully licensed drivers with a single medical condition had significantly higher at-fault crash risk, as follows:

- learning, memory relative risk =3.32
- alcohol and drugs relative risk =2.22
- neurological relative risk =2.20
- epilepsy relative risk =2.02
- psychiatric relative risk =1.85
- musculo-skeletal relative risk =1.84
- visual acuity relative risk =1.52
- diabetes relative risk =1.46
- pulmonary relative risk =1.26

Charlton and colleagues undertook a comprehensive review of medical conditions and driving and concluded that eight conditions were likely to result in at least a moderately elevated risk of crash involvement compared with controls (Charlton et al. 2004).

- dementia relative risk = 2.1-5.0
- epilepsy relative risk = 1.1-5.0+
- multiple sclerosis relative risk = 2.1-5.0
- psychiatric disorders relative risk = 1.1-5.0
- schizophrenia relative risk = 2.1-5.0
- sleep apnoea relative risk = 2.1-5.0+
- cataracts relative risk = 2.1-5.0
- alcohol abuse & dependence relative risk = 1.1-5.0

This study also compared the licensing guidelines from six countries: Canada, Australia, UK, USA (Utah only), New Zealand and Sweden. The authors concluded that in most cases the guidelines were not consistent with the evidence and in many respects went beyond the scientific evidence held at this stage (Charlton et al. 2004).

Finally, a recent study in Norway assessed the relative risk associated with different medical conditions after adjusting for age and driving distance (Sagberg 2006). The conditions that the authors found to have a higher relative risk than controls were:

- diabetes (only when not controlled by medication – i.e. type ii)
- psychological disorders (anxiety, depression and the use of anti-depressant medication)
- visual deficits (including the use of glasses and contact lenses).

4.2 Is mandatory medical screening an effective countermeasure?

Most of the limited research undertaken in this area has occurred in relation to older drivers.

One of the first evaluations of the effectiveness of mandatory age-based assessment programs compared the Finnish and Swedish licensing practices (Hakamies-Blomqvist et al. 1996). Finland cancels a driver's licence at age 70 years and requires regular medical checks if the licence is to be reinstated and thereafter renewed, whereas Sweden has no age-related controls. No crash-reduction effects of the Finnish program could be detected compared to Sweden.

An Australian study also evaluated the effectiveness of different licensing systems by comparing older driver (75 years and above) casualty crash rates across the different licensing jurisdictions in Australia (Torpey 1986). All jurisdictions had some form of mandatory age-based assessment, except for Victoria where older drivers were assessed only if they were referred to the licensing authority, usually following a crash or traffic misdemeanour. It was found that the Victorian crash rate per head of population was very similar to those in New South Wales and South Australia, and lower than the crash rates for Queensland, Tasmania and Western Australia. Despite its lack of a mandatory assessment program, Victoria had the lowest older driver crash rate per number of licences issued and it was concluded that there were no demonstrable safety benefits for mandatory assessment programs.

After weighing the limited evidence available to it at the time, an OECD Expert Group reported:

Mandatory medical assessment of all drivers at a certain age to detect those who are unfit to drive is neither cost-efficient nor beneficial. This is in part because a driver's health does not necessarily equate to fitness to drive. When a health problem has been identified, the question of whether to continue driving depends not on a medical diagnosis but rather, on the functional consequences of the illness. And for different people, a given condition may affect fitness to drive in different ways and to different degrees (p. 83) - (OECD Expert Group 2001).

This stance has been confirmed by the latest research.

An update of the earlier Australian study (Langford et al. 2004b), repeated the finding that older drivers in jurisdictions with age-based mandatory assessment programs could not be shown to be safer than drivers in Victoria. Further, the authors found some evidence that older drivers in Victoria may have a significantly safer record regarding overall involvement in serious casualty crashes.

A sequel to this study (Langford et al. 2004a). examined the casualty crash involvement rates of drivers aged 80 years and older in Melbourne (no regular assessment) and Sydney (regular medical and on-road assessment), using population, number of licences held, total distance driven, and time spent driving as exposure measures. Results showed that while there was no difference in crash risk based on population, older drivers in Sydney had statistically higher rates of casualty crash involvement than their Melbourne counterparts per licensed driver and per time spent driving. A similar trend was apparent based on distance travelled but was only of borderline statistical significance. Based on these two studies, it was concluded that mandatory licence re-testing schemes of the type evaluated have no demonstrable road safety benefits – and may even result in an increased concentration of unsafe drivers on the road.

Most recently, a US study (Grabowski, Campbell & Morrissey 2004), investigated whether the different licensing procedures for older drivers across individual States could be associated with differences in older driver fatality rates. Two regression techniques were used to study the effects of the following variables related to state laws: (a) laws mandating in-person renewal; (b) laws mandating vision tests; (c) laws mandating on-road tests; and (d) renewal period. They found that the only variable that had any significant association with a lowered fatality rate was in-person license renewal, only for drivers aged 85 years or more. Their conclusion was that more stringent state licensure policies such as vision tests, road tests and more frequent licence renewal had no additional safety benefits.

Whether these results pertaining to mandatory medical assessment for older drivers can be extended to mandatory medical testing as a pre-condition for licensing at younger ages remains problematic. A search of the available literature failed to find any reliable evidence regarding possible safety benefits arising from medical (including vision) testing immediately before or at regular periods during licensing.

5 POLITICAL, SOCIAL AND OTHER FACTORS

The problem of medical conditions and driver licensing is a difficult one to address. GPs are able to report drivers with identified impairments to licensing agencies, but there is often perceived ambiguity regarding patient confidentiality, patient-doctor relationships and legal liability. Ethical and legal guidelines place an extensive burden on health professionals to create a balance between a patient's rights and needs, and the safety of the community (Andrea, Charlton & Fildes 2001):

- Individual jurisdictional legislation provides some indemnity by stating that a health professional does not incur civil or criminal liability for carrying out a test or examination and expressing to the licensing authority an opinion formed as a result of that test or examination.
- Civil law in Australia also states that a health professional may be liable if a court decides that reasonable action has not been taken to ensure that impaired patients do not drive in circumstances that place the community at increased risk. Further, patients who continue to drive whilst aware that they have a condition that impairs their ability to drive safely, may also be at risk of significant common law liability.
- The ethics code of the Australian Medical Association and the Australian Optometrical Association declare that information may be disclosed where it is necessary to protect the safety of others, or when ordered by a court.

To this end, it is suggested that health professionals as a bare minimum, should advise patients of the risks associated with their medical condition, and of their legal obligations pertaining to driving (Austroads 2003).

However, there remain difficulties in this area. It was noted in the Utah study that it is unlawful for any State or local government under the *Americans with Disabilities Act* to discriminate against a qualified person with disabilities on the basis of those disabilities (Vernon et al. 2001). While this has not emerged as a problem in Australia, it would need to be considered carefully in the event of any amendments to licensing procedures for those with medical conditions or disabilities.

Further, anecdotal evidence from licensing authorities and from the medical profession suggests that many doctors are dissatisfied with their expected role in the licensing process. Legal and ethical issues aside, some doctors argue that any judgement about fitness to drive and the possible removal of a driver's licence is the business of the licensing authorities – with the maximum role that can be expected of doctors being to provide appropriate medical input.

In the meantime, while current attempts at identifying at-risk drivers through mass medical screening might lack research evidence of their effectiveness, it remains that licensing authorities have a responsibility to continue to search for strategies for managing drivers with 'red flag' medical conditions (Dobbs 2001). In this context, the approach recommended by the OECD Expert Group in assessing the association between a medical or health-related condition and crash risk, may well have relevance beyond just older drivers. The approach consists of the following decisions:

- Determine whether the condition in each case has functional consequences that are relevant to driving.
- If there are functional consequences, determine whether they necessarily lead to increased crash risk or whether the individual can compensate for them.
- If there is substantial injury risk, identify and, as appropriate, implement countermeasures to reduce the risk.
- If there are no effective countermeasures, balance the costs of crash risk against the cost of possible cessation of driving.

6 CONCLUSIONS

Although there is some evidence to suggest a link between certain medical conditions and relative crash risk, at present the research has not been able to identify any strong association between mandatory medical testing for any age group (from young to older drivers) and crash risk.

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