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## The need for consistency and equity in driver education and assessment post-stroke

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### ABSTRACT

People who are unable to resume driving after a stroke often experience reduced participation. Return to driving is made difficult by inconsistencies in knowledge regarding legislation, the occupational therapy driving assessment process and access to services. As a result, inequities exist between and within states and territories of Australia. Some drivers miss out on, or bypass formal assessment, while other drivers experience rigorous assessment which may result in licence cancellation. In this viewpoint, the authors propose a way forward to increase the equity of access to driver education and assessment post-stroke in Australia. Strategies proposed to improve consistency and equity include greater education, evidence based written documentation of procedures, a systematic review of current off-road driver assessments and the transfer of administration of driving assessment services from health to transport authorities.

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### 1. Introduction

Incidence of stroke worldwide is reportedly 15 million with 5 million of these people dying and 5 million being left permanently disabled (WHO, 2002). Each year in Australia there are approximately 50,000 stroke events and 12,000 people who have a subsequent stroke (Australian Institute of Health and Welfare, 2013). This health burden will continue to grow as the population ages, especially in light of data that indicates approximately 50% of stroke survivors need assistance with household chores, home maintenance and mobility (Hankey et al., 2002).

In Western countries, such as Australia, driving is important for social and community participation (Barnsley et al., 2012). However, following stroke return to driving is difficult due to potential impairments limiting vision, cognitive and/or motor function (Edwards et al., 2008). Further, return to driving has safety implications such that the probability of being involved in an accident increases for post-stroke drivers, with an adjusted odds ratio of 1.93 (Sagberg, 2006). Australian guidelines (Austroads, 2012) indicate that stroke physicians, neurologists and general practitioners should make a clinical judgement about a person's fitness to drive, and need for a driving assessment. An on-road driving assessment is often considered the gold standard in determining fitness to drive post-stroke. However, it is unknown how many people are referred for, and successfully complete either an on or off-road driving assessment in Australia before they return to driving post-stroke. One study found only 19% of stroke survivors from a rehabilitation unit in South Australia had returned to driving at the six month follow-up (Allen et al., 2007), but the proportion that received information or referral for a driving assessment was not reported. Overseas estimates suggest that between 30 and 58% of people return to driving post-stroke (Lee et al., 2003; Tan et al., 2011). If the number of stroke survivors doubles by 2017, as is currently predicted (Australian Institute of Health and Welfare, 2013), the number of survivors that return to driving will also increase. This increase will place pressure on existing driving assessment services and licensing authorities in order to adequately address safety issues.

Decisions regarding return to driving are further complicated by the fact that many people with neurological diseases, including stroke, are reluctant to relinquish their licence. As a result some stroke survivors do not follow medical advice to cease driving (Patomella et al., 2009). In addition, anecdotal reports and some published data suggest that stroke survivors are unaware of regulations in regards to

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driving after stroke and make decisions about return to driving without professional advice and/or evaluation (Fisk et al., 2002). Currently in Australia, some people are advised by healthcare professionals to complete an occupational therapy driving assessment post-stroke while others are not (Barnsley et al., 2012). Stroke survivors may also be apprehensive about returning to driving, and unnecessarily delay or avoid completing an assessment, with implications for community participation (Barnsley et al., 2012). This is a concerning outcome given current literature identifying licence loss as a precursor for depressive symptoms (Marottoli et al., 1997; Ragland et al., 2005) and low self-esteem (Whitehead et al., 2006). The aim of this article is to highlight inconsistencies which exist in knowledge about return to drive legislation, access to occupational therapy driving assessment services, and the limited body of research which exists about the 'best' off-road driver assessment. By identifying these inconsistencies we can begin to address them.

## 2. Knowledge of legislation

Current Austroads guidelines (Austroads, 2012) recommend that people who have had a stroke should not drive for at least one month post-stroke. Following this period of non-driving, the process of return to driving is handled differently across states and services (Vicroads, 2014; Roads and Maritime, NSW, 2014; Department of Infrastructure and Energy, Tasmania, 2014; Department of Transport and Main Roads, Queensland, 2013; Department of Transport, Energy and Infrastructure, South Australia, 2014; Department of Transport, Northern Territory, 2012; Department of Transport, Western Australia, 2014; Road Transport Information Management, Australian Capital Territory, 2014).

In Australia some stroke survivors who are left with residual deficits, are required to obtain a letter, certificate or some 'evidence' of fitness to drive from a medical practitioner and complete a visual acuity test (Austroads, 2012). Written clearance to drive is then forwarded to the licensing authority but the responsibility for this task is not always clear. In other instances, when the medical practitioner decides the stroke survivor is fit to drive and there has been no formal withdrawal of the stroke survivors drivers licence, verbal clearance only is provided. As a result, it can be seen that confusion exists between health professionals and licensing authorities concerning the 'correct' process for return to driving in terms of a standard form, a letter, or verbal clearance (Barnsley et al., 2012). Reasons for the differences in advice given may include limited attention by the medical educators to driving policies and focus given to driving safety and risks in medical curricula, as well as differences in state legislation. As a result, inconsistencies exist in the information provided to people following stroke which leads to inequities in return to driving and premature limiting of driving or even driving cessation.

Australian legislation regarding the return to driving assessment process have been clearly summarised in the recent National Stroke Foundation (NSF) guidelines (NSF, 2010). The NSF guidelines outline a three step process for off and on-road assessments. Firstly, stroke survivors should undertake a medical assessment of fitness to drive by a medical practitioner. Secondly, a comprehensive off-road driving test of motor, sensory, visual and cognitive skills should be undertaken by a multidisciplinary team. This test may incorporate a standardised off-road driving test such as Dynavision Performance Assessment Battery (Klarora et al., 2000) the Cognitive Behavioural Driver's Inventory (Bouillon et al., 2006) or newly developed Australian tests such as DriveSafe DriveAware (Kay et al., 2009) and the Occupational Therapy Driver Off-Road Assessment Battery (Unsworth et al., 2012). Finally, an on-road driving test should be undertaken with a driver trained occupational therapist and driving instructor. Where uncertainty exists about fitness to drive, NSF guidelines (2010) recommend that medical practitioners make a referral for an occupational therapy driving assessment.

## 3. Inconsistencies in occupational therapy driving assessment procedures across Australia

Currently most Australian occupational therapists involved in driving assessments carry out a battery of standardised and non-standardised off-road driving skills assessments. These assessments test cognitive, perceptual and motor skills required for driving. The off-road assessment is followed by an on-road driving assessment (NSF guidelines, 2010) The on-road assessment is usually conducted in a dual-controlled vehicle, with a driving instructor and an occupational therapist seated behind, observing and recording driving behaviour (NSF guidelines, 2010).

While both Austroads (2012) and NSF guidelines (2010) recommend an occupational therapy on-road driving assessment, it is not mandatory. Further, where concerns remain about driving ability, confusion exists about which stroke survivors should complete this on-road assessment (Barnsley et al., 2012).

Anecdotal evidence suggests that some health professionals advocate that all stroke survivors should be assessed on-road after the mandatory one-month period to ensure a safe return to driving. However, neither Austroads (2012) or NSF (2010) guidelines recommend an on-road assessment for all people post-stroke as this can be a costly and time consuming process that is not always necessary.

In order to address confusion Alexandersen et al. (2009) recommend a multidisciplinary approach to determining fitness to drive, including a neuropsychological, medical and on-road assessment as the most thorough assessment approach. In light of this recommendation, there is a need for improved training of undergraduate and graduate stroke health professionals in Australia about the processes involved in assessment for return to driving post-stroke, and a validated process to determine which standardised off and on-road assessments are recommended towards a comprehensive, multidisciplinary approach addressing return to driving post-stroke.

## 4. Lack of agreement about the best occupational therapy off-road driving assessment

Decisions about fitness to drive are complicated by the diversity of assessments used and the lack of agreement between occupational therapists about the 'best' (most accurate and predictive) assessment to use prior to on-road testing (Unsworth et al., 2010). A 'good' test is considered one with good specificity, repeatability, reliability and sensitivity (Marshall et al., 2007). As a result, several off-road driving assessments are recommended by the Australian guidelines (NSF, 2010) and are used by Australian occupational therapists; these are discussed as follows.

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