
Peer-reviewed papers

Original Road Safety Research

Determining Fitness to Drive for Drivers with Dementia: A Medical Practitioner Perspective

Joanne M. Bennett^{1,2}, Eugene Chekaluk², Jennifer Batchelor²

¹Australian Catholic University, Sydney, Australia

²Macquarie University, Sydney, Australia

Corresponding Author: Dr Joanne Bennett, Australian Catholic University, 25A Barker Road, Strathfield, NSW, 2135, joanne.bennett@acu.edu.au, +61 2 9701 4398

This peer-reviewed paper was first presented as an Extended Abstract and Oral Presentation at the 2018 Australasian Road Safety Conference (ARSC2018) held in Sydney, NSW, Australia and first published in the ARSC2018 Proceedings in the form of an Extended Abstract. It was expanded into a 'Full Paper' and underwent further peer-review by three independent experts in the field. It is being reproduced here with the kind permission of the authors and is now only available in this edition of the JACRS.

Key Findings

- Fitness to drive determinations are predominately left to medical practitioners
- Practitioners largely rely on self-report information to make decisions
- Almost all practitioners reported belief that they missed cases of unsafe driving
- Over 85% of practitioners support the need for an objective assessment tool
- Practitioners have not received professional development

Abstract

Currently in Australia medical fitness to drive decisions for people with dementia are largely conducted by front line medical practitioners. Little is known about the processes that these practitioners use to make these decisions, and how current guidelines assist in making determinations about driving capacity. A short survey was completed by 42 practitioners. The results of the survey supported previous findings that practitioners do not feel comfortable with making the decision regarding fitness to drive for people with dementia. Practitioners relied largely on self-report or informant information regarding current driving practices. Although practitioners reported that the level of cognitive functioning was the most important factor in determining safe driving, only 25% of practitioners employed cognitive assessments. Whilst the vast majority of practitioners were aware of the fitness to drive guidelines, over half did not find them to be sufficient in enabling determinations of driving capacity. Due to this, almost all practitioners reported that they believe they have missed cases of unsafe driving in this population with over 85% endorsing the need for a more objective tool. Significantly, over three-quarters of practitioners reported that they have never received training on how to make fitness to drive decisions. Given that the current driver licensing system for people with dementia depends on medical fitness to drive reviews, the lack of confidence by practitioners regarding making fitness to drive decisions can have a detrimental impact on both the safety of the individual drivers, but also the community as a whole.

Keywords

Dementia, Driving, Fitness to Drive, Practitioners

Introduction

Dementia is an overarching term for a variety of conditions, all of which encompass a progressive loss of global cognitive function beyond what is expected from normal ageing (McKhann et al., 2011). As the population ages, the prevalence of dementia is set to increase, with incidence projected to double to 115.4 million people worldwide by the year 2050 (Prince et al., 2013). Due to the increasing prevalence of dementia, coupled with the desire to remain mobile in older age, it is anticipated that there will be a large jump in the number of people with dementia driving (Carr & O'Neill, 2015). Given the increased risk of people with dementia being involved in a motor vehicle crash (Carr & Ott, 2010), the rising prevalence of these individuals on the roads has serious road safety implications, both for themselves and for other road users. Whilst the impact of dementia on driving performance is clear, simply having a diagnosis of dementia is not considered an automatic preclusion from driving. This is because in the early phases of the disease many people with dementia can continue to drive safely for some time (Ott et al., 2008). Due to the progressive nature of dementia all people with dementia will eventually need to cease driving, but the process for deciding when one is no longer fit to drive is not clear cut.

As it stands globally there are different standards regarding driving licensing requirements for people with dementia (Seiler et al., 2012). Most concur that simply having a diagnosis of dementia should not preclude an individual from driving (Carr & O'Neill, 2015). In a number of countries such as the UK, USA and Canada, medical fitness to drive reviews for people with dementia are routine (Lincoln & Radford, 2014; Meuser, Carr, Unger & Ulfarsson, 2015; Moorhouse, Hamilton, Fisher & Rockwood, 2011; Rapoport et al., 2014). The benefit of in-office reviews is that they are widely accessible and cost effective compared to on road assessment (Wilson & Pinner, 2013). Currently there is no universal approach to in-office fitness to drive determinations, with each country differing in terms of the recommendations given to practitioners on what methods to use to make this decision (Lincoln & Radford, 2014). This lack of a universal approach is in large part because to date research has not been able to formulate a consensus on a reliable battery of tests (Rapoport et al., 2018). Furthermore, usable cut off scores have not been validated, limiting the clinical utility of proposed tests (Bennett, Chekaluk & Batchelor, 2016). In an attempt to address these issues, a team of international experts reviewed the literature and have proposed potential international guidelines on dementia and driving (Rapoport et al., 2018).

In Australia, it is mandatory that once diagnosed an individual must report the diagnosis to the relevant driving licensing agency and undergo periodical medical fitness to drive assessments with their general practitioner or primary medical care practitioner (Carmody, Traynor & Iverson, 2012). Practitioners are required to assess an individual's driving capacity by following the medical fitness to drive guidelines provided by Austroads (2012; 2016). The

guidelines by Austroads (2012; 2016) are designed to provide practitioners with the information necessary to make decisions regarding driving competence for people with various medical conditions, including dementia. Currently under these guidelines all dementia aetiologies are grouped together, with no distinctions made between the different syndromes despite there being mounting evidence of the differential impact of dementia aetiology on driving performance (Piersma, de Waard, Davidse, Tucha, & Brouwer, 2016). The guidelines provide four pages of information on making fitness to drive assessment for people with dementia. Information covered includes: how dementia impacts on driving, an outline of points helpful in assessing a person (i.e. questions to ask about their driving history and driving habits), the medical standards for licensing (i.e. that an individual cannot hold an unconditional licence and an explanation of a restricted licence) and a table of medical standards which states that to hold a conditional licence information must be provided by a doctor regarding level of impairment of visuospatial perception, insight, judgement, attention, comprehension, reaction time or memory, and the likely impact on driving performance. Whilst these guidelines provide a general overview for practitioners, little guidance is provided on what tests they should use to examine these factors, and what levels of performance on the above skills correspond with either safe or unsafe driving outcomes. In New South Wales, if a medical practitioner does not feel confident in making the decision, they can refer the patient for on-road testing, which in the case of dementia is completed by a trained occupational therapist. These assessments, whilst an effective judge of fitness to drive, are costly and therefore not an option for all patients. As a result, for many patients and practitioners, the medical fitness to drive assessment is their only assessment of driving capacity. Whilst final determinations of drivers licence status are made by the relevant driver licencing agency, the recommendation of the medical practitioner made as a result of the fitness to drive assessment is often implemented.

It is unknown whether practitioners find the information provided in these guidelines to be sufficiently useful. It would be prudent to determine whether these guidelines assist practitioners in determining how to test the above mentioned cognitive skills and also whether they feel that this in-office assessment extends to providing reliable information about the on-road driving performance of their patients. It would therefore be important to examine what they believe determines safe driving, the methods/tests they are employing in clinical practice, how long they set aside to make these decisions and the degree of consistency across practitioners in the methods utilised. Furthermore, little is known about whether practitioners are comfortable with their role in making fitness to drive decisions for people with dementia.

As it currently stands in Australia, whilst researchers have examined the role of practitioners for fitness to drive for older drivers generally (Jones et al., 2012; Lipski, 2002; Sims et al., 2012), they have not yet isolated the

experiences related specifically to people with dementia with the exception of one study conducted over a decade ago (Snellgrove & Hecker, 2002). As a result, the current study was designed to fill this gap by examining practitioner perspective on this decision making process for people with dementia. Despite previous research focusing on the primary care general practitioner, to examine the full scope of various perspectives, the current study examined all key practitioners who have a role in this decision making process, including, general practitioners, geriatricians, neurologists, neuropsychologists and occupational therapists. By examining the perspectives of front line practitioners who are responsible for making these determinations, this study aimed to provide insight into both current practices that are effective, and areas which need might need improvement to provide a better and more accurate system for determining fitness to drive for people with dementia.

Methods

Recruitment

Between the months of August and November 2016, a cross-sectional survey was mailed out to practitioners in NSW. A total of 400 questionnaires were distributed to practitioners who are likely to be involved in decision making regarding fitness to drive for people with dementia within NSW. In total, 305 General Practitioners, 41 Geriatricians, 24 Neuropsychologists, 15 Occupational Therapists and 15 Neurologists were contacted. Ethics approval was obtained for this study from the Macquarie University Faculty of Human Sciences Research Ethics Sub-Committee (Ref: 201600371).

Potential participants were selected at random to cover both rural and metropolitan regions of NSW from online databases obtained through a Google search, which listed practitioners by specialty and location. Participants had the option to complete the survey online or via a paper and pen format. All potential participants received, via mail, an introductory letter, the questionnaire, a flyer with the link to the online version of the questionnaire and a reply paid envelope so they could return completed questionnaires anonymously and without cost. Key governing bodies such as the Royal Australian College of General Practitioners were contacted to assist with disseminating the questionnaire to members, but no response was received.

The Questionnaire

The questionnaire consisted of 31 questions, which encompassed five sections. The development of the questionnaire drew upon previous literature, and followed discussions with key stakeholders including practitioners, dementia care support workers and dementia carers. The questionnaire consisted of both closed and open questions. As the questionnaire was designed to be anonymous to increase response rates, demographic information about the practitioners was not obtained. The five sections of the questionnaire included: 1) professional practice (including

practitioner type, years practising, number of clients with dementia), 2) level of awareness of driving (5 point likert scale of level of awareness of licence status and driving behaviours), 3) their driving assessment procedure (type of questions asked of patients, assessment tools used, time spent on the assessment etc), 4) reactions to the driving assessment (both patient and family), and 5) their understanding and opinions regarding the current guidelines and future developments (how informative do they find the guidelines, what changes would they make etc.).

Surveys were analysed via a mixed methods approach through the examination of descriptive statistics and thematic analysis of response where appropriate. Between profession group differences were examined through analysis of variance where appropriate.

Results

Return Rates

A total of 42 responses were received, 16 completed online and 26 returned via paper, yielding a response rate of 10.5%. A further 30 questionnaires were returned to sender accounting for a further 7.5%. In total responses were received from nineteen general practitioners (6.2% return rate from general practitioner sample), nine geriatricians (21.95%), seven neuropsychologists (29%), six occupational therapists (40%) and one neurologist (6.67%).

Professional Practice

The majority of practitioners had been working in their profession for more than 20 years, accounting for 74%, with 14% having worked between 10 and 20 years, and 12% having been in their profession for less than 10 years. In a typical month, they reported seeing more than 15 patients with dementia (28%), between 10 to 15 patients (10%), between 5 and 10 patients (26%), between 2 and 5 patients (24%), only 1 patient (5%) and no patients with dementia (7%). Practitioners cited on-going care (67%), diagnosis (48%), and treatment (43%) as their primary reason for involvement with patients. A further 12% mentioned that their involvement with patients was purely to perform driving assessments, with all of these respondents ($n=5$) being occupational therapists who specialise in driving assessment. On average, 59% of practitioners estimated that they saw the patient on more than one occasion.

Level of Awareness of Driving

Practitioners were asked to report on how aware they were of the driving habits of their dementia patients. Over half of all respondents were always aware of whether their patients held a drivers licence (56%), with the remainder (44%) reporting being aware of the licence status of their patients most of the time. A total of 42% of practitioners reported always being aware of whether their patients had access to a car, whilst 49% reported being aware of this most of the time. Practitioners were asked if they were aware of whether their patients drove on a regular basis. A total of

39% reported being always aware, 54% being aware most of the time, and the remainder of practitioners reported only sometimes being aware of whether their patients drove on a regular basis. Finally, practitioners were asked if they knew of the reasons that their patients would have for driving (i.e. running errands, family commitments, social activities), and therefore the locations to which their patients drove (i.e. residential driving, highway driving, city driving). A total of 27% reported that they were always aware of the driving habits of their patients, 58% reported being aware of this in most cases, with the remainder stating that they were only sometimes aware of the driving habits of their dementia patients.

Driving Assessment Procedure

Practitioners reported making, on average, 11.58 ($SD=17.3$) fitness to drive assessments for patients with dementia per year, with general practitioners reporting on average making 4.53 ($SD = 4.2$) assessments per year. Furthermore, practitioners reported that on average they spent 64.61 ($SD=59.39$) minutes making a fitness to drive assessment, with general practitioners spending the least amount of time on assessments, averaging just 22.22 ($SD=15.74$) minutes.

The questions that practitioners asked their patients when investigating fitness to drive were organised into eight themes, with these themes as well as the percentage of practitioners who reported each reported in Table 1. Further, practitioners were asked whether they utilised any specific in-office tests to assist with making this determination. The list of tests used was divided into physical, cognitive and driving tests and is presented in Table 2. Of note, when asked about in-office tests, 38.1% still reported using results of an on-road driving assessment to make their determination.

When asked what they believed determined safe driving for people with dementia, six themes emerged, these included: level of cognitive function (67% reported), level of insight (38%), on-road performance (38%), family response to their driving (31%), driving history (21%) and physical capacity (14%).

A total of 33% practitioners reported always referring patients for an on-road assessment, 33% as sometimes referring on, and 33% as never referring for on-road assessment (occupational therapists who conduct driving assessments were excluded from this analysis). Of those who cited reasons for not referring on, the most common reason ($n=5$) for not doing so was “*when impairment was obvious enough to make the decision in-office*”. Furthermore, 77% reported that they did not adjust their assessment procedure depending on the dementia diagnosis, with one general practitioner reporting “*All dementia is the same with regards to driving*”. Finally, 87% of the practitioners reported that they have likely missed cases of unsafe driving in patients with dementia.

Table 1. Themes investigated by practitioners when determining driving safety for patients with dementia

Themes	% Of Practitioners who investigated (n)
Current Driving Behaviours	64 (27)
Informant Interview	33 (14)
Cognitive Tests	21 (9)
Driving History	10 (4)
Medical History	7 (3)
Physical Tests	7 (3)
Insight	2 (1)
Vision	2 (1)

Table 2. In-office tests used to make fitness to drive determinations

Tests	% Practitioners Reported Use (n)
Physical Tests	
Non-Specific General Physical Screen	17 (7)
Vision Test	10 (4)
Strength	5 (2)
Coordination	5 (2)
Hearing Test	2 (1)
Cognitive Tests	
Mini Mental State Exam	29 (12)
Trail Making Test Part B	19 (8)
Trail Making Test Part A	17 (7)
Non-Specific General Cognitive Screen	14 (6)
Montreal Cognitive Assessment	12 (5)
Clock Drawing Test	12 (5)
Insight Test	7 (3)
Visuospatial Test	7 (3)
Frontal Battery	5 (2)
Rey Complex Figure	5 (2)
Block Design	2 (1)
Digit Span	2 (1)
Maze Test	2 (1)
Wechsler Adult Intelligence Scale IV	2 (1)
Wechsler Memory Scale IV	2 (1)
Visual Reproduction	2 (1)
Driving Tests	
DRIVESafe	7 (3)
Road Rule Knowledge	2 (1)

Reactions to the Driving Assessment

Practitioners were asked whether there were any instances in which they would prefer not to discuss the issue of driving with a patient, with 72% reporting that they are always prepared to have this conversation. Of those who reported that they do not always discuss driving with patients, the main reason ($n=12$) cited *“it is a difficult conversation to have”*.

When asked about the reactions from patients, 72% of practitioners reported that reactions from patients were very variable. Similarly, when asked about the reactions from family 59% cited that the responses tend to be mixed. A list of the reactions identified is presented in Table 3. Of important note, a number of practitioners ($n=8$) noted that the reaction by the patient depended greatly upon the level of insight that the individual had into their condition. With respect to family reactions, various practitioners ($n=5$) noted that the nature of the reaction was influenced by whether they had a vested interest in the patient continuing to drive.

Table 3. Reactions of patients and carers to conversations regarding driving

Reactions to Driving Conversations	% Practitioners who reported (n)
Patients	
Accepting/Positive	52 (22)
Angry	40 (17)
Denial/Defensive	29 (12)
Upset/Anxious	21 (9)
Worried/Concerned	7 (3)
Carers/Family	
Relief	43 (18)
Happy	26 (11)
Supportive	14 (6)
Vested interest in driving continuance	12 (5)
Concern for their independence	12 (5)
Concern about backlash from patient	10 (4)
Angry	7 (3)
Shock	5 (2)

Current Australian Guidelines and Future Developments

Approximately, 67% of practitioners reported being aware of the legal requirements with respect to driving with dementia, and were correctly able to identify the nature of those requirements, however, this means that 32% were unaware that there were any legal requirements related to driving with dementia. A total of 87% were aware of the Austroads medical fitness to drive guidelines, however, opinions regarding the usefulness of the guidelines were mixed with 43% reporting that they were very informative, 31% reporting that they are somewhat useful and 26% did

not find them useful. Reasons for not finding the guidelines useful included: *“long winded”*, *“very general”*, *“vague in the area of dementia”*, *“not helpful in a clinical setting”*, and *“not very helpful as leaves discretion to the practitioner”*. For those who did not find the guidelines very useful, a few suggestions were made for improvements. The most frequent suggestion was that there need to be more detailed, specific and objective instructions ($n=8$). A few suggested the need for detailed decision pathways ($n=3$), one named the need for cut-off scores, one named a need for the guidelines to be updated regularly, and one mentioned that a hard copy desk version should be provided to practitioners. This quote summarises the views of a number of the practitioners, *“A lot is left up in the air in terms of making final decisions about suitability to continue driving”*.

When asked if there should be a more objective assessment for determining driving capacity for people with dementia, 85% stated that a more objective test was needed. The key rationale for a more objective test was summarised as *“it would be helpful to take the onus off general practitioners who generally want to maintain their relationships with patients”*. Suggestions for the form that this assessment should take included an on-road driving assessment (24%), a battery of tests (14%), a brief questionnaire/checklist (10%), and using road rule tests (2%). Of those who mentioned on-road assessments, four went on to say that these tests were only appropriate if they were more affordable and available in rural communities. Furthermore, of priority to a number of practitioners (17%) was that any objective assessment introduced was shown to be a reliable predictor of driving performance.

A total of 25% of those surveyed believed medical practitioners should be responsible for making fitness to drive decisions for people with dementia, whilst conversely 25% believed that it should not be up to practitioners. On the other hand, the majority (50%) of practitioners believed that it should be a combined approach. Of those who advocated for a combined approach, 66% believed that assessments should be performed by a multidisciplinary team with occupational therapists performing on road assessment, such as *“in conjunction with specialists and where applicable, occupational therapist driver assessors”*. Family members were also mentioned as needing to be involved in the decision making process with 9% mentioning *“families must also take responsibility”*.

In relation to professional development, 78% reported never having any professional development in the area of dementia and driving, with 98% reporting that they would like to receive professional development.

Discussion

The current study aimed to investigate the perspectives and experiences of the key practitioners: general practitioners, geriatricians, neurologists, neuropsychologists and occupational therapists, involved in making fitness to drive determinations for people with dementia. The comments in this discussion are to be considered in light of the small sample size of this study. The respondents to this

questionnaire fell across the range of professions and were mostly experienced practitioners with greater than 20 years' experience who engaged with dementia patients on a regular basis. The majority of practitioners surveyed reported being aware of the driving habits of their dementia patients. This suggests that practitioners are largely mindful that driving is an important consideration in this population.

General practitioners reported spending on average less than half an hour making fitness to drive assessments. This is consistent with findings from previous research which revealed that when making decisions on driving performance practitioners spend anywhere from less than 10 minutes to about 30 minutes (Omer et al., 2014). This issue of time is an important consideration for both researchers and policy makers to take into account when suggesting in-office clinical tools. Any in-office tool must be able to be conducted in less than 30-minutes to align with the time frames that general practitioners have available (Omer et al., 2014).

The current Austroads guidelines provide information on the factors about which physicians should ask questions but few details are provided on how practitioners should achieve this. Given this lack of direction provided by the guidelines, this study examined the procedures employed by practitioners when examining fitness to drive. Most commonly, practitioners asked questions around current driving behaviours, which required self-report answers. Whilst self-report is often a reasonable approach, in the case of dementia, this form of questioning might not be the most reliable indicator of real world driving performance due to limits in memory and insight. Given these limitations previous research by Carr and colleagues (2006) has recommended that informant interviews about driving behaviours should be conducted, however, the current study showed that only 33% of practitioners undertook this practice. Given that informant interviews are not always reliable, cognitive testing has been regularly employed in clinical settings (Breen et al., 2007). In the current sample, almost one quarter of practitioners reported utilising cognitive tests, however, there was little consistency in the specific measures that they employed. This is likely a consequence of the lack of consensus regarding which cognitive tests are reliable, and a lack of cut off scores to enable their clinical use. Research is still continuing to try to develop such a clinical tool, and should be a priority (Bennett, Chekaluk & Batchelor, 2016). Whilst current international recommendations stipulate that a single test is not sufficient for determining fitness to drive, abnormal performance on cognitive tests could reveal that a more extensive evaluation of their driving performance is necessary (Rapoport et al., 2018). Whilst recommendations on specific cognitive tests are not possible yet, this kind of recommendation should be incorporated into the Austroads guidelines to better inform practitioners on how cognitive testing can assist in their determinations.

Despite only a quarter of practitioners utilising cognitive tests, when asked what they believed determined safe driving, the most common response was level of cognitive function, with almost two thirds of respondents reporting

this. It therefore appears that there is a disconnect between what practitioners believe contributes to safe driving, and what they actually test in-office. Future research needs to further examine the reasons why this disparity exists and perhaps how to better train practitioners in the use of cognitive testing so that this form of assessment is implemented in day to day practice.

The current study was the first, to the authors knowledge, that examined whether practitioners employed different approaches when assessing driving for the various dementia aetiologies. This was important to investigate due to the fact that recent research has highlighted that the various dementia profiles have differential impacts on driving performance (Piersma, de Waard, Davidse, Tucha & Brouwer, 2016). Piersma and colleagues (2016) argued that different approaches to assessing fitness to drive might be required for the various forms of dementia. The findings of this study suggests that the majority (77.5%) of practitioners may not be aware of the differential impact that the dementia aetiologies have on driving performance and therefore they reported that their approach to assessing driving performance does not change in light of diagnosis type. It is important therefore that further exploration is conducted into the distinctions between the dementia types, the impact that these have on driving performance, and the best ways to examine these differences in an office setting. Furthermore, a component of any future education for practitioners must include evidence based information on the differences between the dementia aetiologies and guidelines on how to perform driving assessments for the various forms.

Practitioners across the board reported having a reasonable level of awareness of the driving situation of their patients with dementia. Furthermore, the majority also reported that they were always prepared to discuss driving and driving cessation with their patients. Consistent with similar studies, a number of practitioners reported that conversations with patients regarding driving are difficult to have and therefore at times it is a conversation which is avoided (Alzheimer's Australia, 2016; Jones et al., 2012). A large contributing factor to the difficult nature of conversations regarding driving is the reaction by the patient/carer. Overwhelmingly practitioners reported that reactions from both patients and carers are mixed and can range from positive and accepting, to negative and aggressive. As a result, part of the rationale for avoiding this conversation was that having discussions regarding driving capacity with patients can negatively impact on the doctor/patient relationship. This concern regarding the breaking down of the client/practitioner relationship is one which has been regularly highlighted in the literature, both nationally and internationally (Jang et al., 2006; Jones et al., 2012; Sims et al., 2012). As has been previously highlighted by Jang and colleagues (2006), further training for practitioners in how to have these conversations with clients is needed. This will help ensure that practitioners feel confident in their ability to have this difficult conversation whilst simultaneously managing and maintaining their relationship with patients.

Almost three quarters of practitioners reported that they were familiar with the legal requirements surrounding fitness

to drive decisions for people with dementia. Whilst this is a majority, it does mean that over one quarter of practitioners are not aware of the requirements surrounding reporting, completion of assessments, conditional licensure etc., which is a concern. It is therefore essential that awareness is raised regarding the legal issues surrounding dementia and driving. Although the vast majority of practitioners were familiar with the Austroads medical fitness to drive guidelines, opinions on the utility of these guidelines were mixed. Practitioners continue to report that these guidelines are not useful, particularly because they are long winded, not translatable to the clinical setting and very general. This is consistent with issues regarding the guidelines raised by general practitioners back in 2002 (Snellgrove & Hecker, 2002). Practitioners were asked to provide suggestions for improvement of the guidelines. Responses include making the instructions more detailed, specific and objective, with the provision of a detailed objective decision making pathways and/or checklists that would be more suitable for use in a clinical setting rather than a large tome containing relatively general information. Similar suggestions have been expressed in previous research by Sims and colleagues (2012).

During the data collection phase of this study, in October 2016, an updated Austroads medical fitness to drive guidelines was released (Austroads, 2016). This update was largely similar to the previous version of the guidelines, with the exception of the introduction of a dementia and driving pathways flow diagram. This updated version does address some but not all of the concerns raised by practitioners. The pathways flow diagram was a suggestion made by one of the practitioners in this study, and provides a good overview of the steps involved in the driving licensing process for people with dementia. These steps include that practitioners should raise the issue of driving with patients, determine if a patient wants to continue driving, that a medical fitness to drive assessment needs to be conducted and then the patient is determined either fit or unfit to drive. With this addition, the guidelines now provide practitioners with an easy to interpret flow diagram on the process involved in driver licensing for people with dementia, however, the guidelines do not provide any additional information on how practitioners determine if an individual is actually fit to drive. This is the key area of concern as there is very little guidance on what determines whether an individual is safe to drive. The information relating to how practitioners assess driving have not been updated since 2012, and there is no mention of what test/tools to use beyond a statement that they should not rely heavily on the Mini Mental State Exam. As a result, practitioners are still left to make a largely subjective decision regarding what constitutes whether an individual with dementia is safe to continue driving, a decision which many report they do not feel comfortable making. These issues therefore still need to be addressed by the policy makers who develop the guidelines. Practitioners have mentioned they would benefit from a checklist with instructions on how to make the decision regarding driving capacity. It might be prudent to determine whether a checklist like approach, whereby the sequential order of each question/test is laid out, with

information on administration and score interpretation accompanying each point, such as the one suggested by Molnar and colleagues (2009) might be able to be implemented in Australia. It is important to note however the limitations of the Austroads guidelines, namely that it is a national set of guidelines that has to apply to different legislations in different states. It is not necessarily possible for the national guidelines to provide the level of specificity of information requested by the practitioners, when this will differ from state to state. As such, the implementation of state based specific information packages might also be worthy of consideration by the different driver licencing authorities.

Only a quarter of respondents believe that medical practitioners should be solely responsible for making fitness to drive decisions for people with dementia. This is not the first time that practitioners have expressed unease with being the final decision maker on driving performance (Jang et al., 2006; Jones et al., 2012; Sims et al., 2012) and is consistent with the argument that practitioners do not believe that they are able to accurately determine the on road driving skills of patients (Jones et al., 2012). As a result, half of the sample advocated for a multidisciplinary approach for determining driving capacity. Although the majority of practitioners also endorsed the need for an objective assessment, they were divided over the form that assessment should take. The two most frequent suggestions were an on-road driving assessment and a battery of in-office tests. Given previously highlighted concerns regarding the cost and accessibility of on-road assessments (Alzheimer's Australia, 2016), the development and implementation of an in-office battery of tests should be a priority for researchers. This is especially crucial given that 89% of practitioners reported that they have likely missed cases of unsafe driving for patients with dementia. Given that the risk of being involved in an accident increases if someone with dementia who is no longer fit to drive continues to do so, it is essential to equip practitioners with the skills, tools and confidence in making reliable fitness to drive decisions.

Of note, over three quarters of practitioners reported never receiving professional development in this area, with almost all reporting that they would like further education into dementia and driving. There is obviously a gap in the training of practitioners and one which needs to be rectified. This study is not the first to report that practitioners are in need of further education with this being a key conclusion made by Jang et al., 2006, Jones et al., 2012, Sims et al., 2012, and Perkinson et al., 2005. Despite further education being consistently highlighted as an important area of need, little has been done to develop and roll out a sufficient training program for practitioners. Such a training program would need to cover issues such as how to approach the topic and manage conversations regarding driver licensing, the legal requirements of fitness to drive, the questions to ask both patients and informants to get a driving history, how to determine medical fitness to drive, the administration and scoring of appropriate assessments, and how to manage the patient/practitioner relationship during this process. Researchers in conjunction with practitioners and policy makers need to ascertain the specific content that needs to

be covered in such a training program, and also the best way to deliver this to practitioners (ie. determine whether face to face, webinars or written documents would be the most appropriate). It is acknowledged that a training program is not a solve all, and that some of the concerns of practitioners, such as maintaining the doctor-patient relationship, will not be entirely solved by such a program. It is hoped however that training will improve the reliability of making fitness to drive determinations, and also provide practitioners with skills to better communicate with patients during the process, and therefore help to maintain the doctor-patient relationship.

This study has provided some insight into the processes and perspectives of the key practitioners involved in making fitness to drive decisions for people with dementia. It is important, however, to note that this is a starting point, and further research is required. This study had a relatively small sample size with a low response rate. Possible reasons for this low response rate could include that significant time pressures exist for doctors during working hours meaning engagement with this research was not possible. Engaging with doctors outside of work might be a more beneficial approach, perhaps through targeting recruitment at medical conferences. Furthermore, this research was completed on a voluntary basis with no incentive for participation, perhaps this needs to be rectified to improve the response rate. Given this, the possibility of response bias must be acknowledged whereby those who engaged with completing the survey are those practitioners who are more invested in this topic area. As a result, the views expressed by the respondents might not be representative of practitioners more generally. To overcome the low response rate and try to reduce response bias, follow up letters to all practitioners should be employed in future as a method to increase response rates. Also it would be beneficial to gain access to databases such as those of the various professional groups to enable recruitment to be targeted towards those practitioners who will engage with people with dementia, as opposed to a more general approach. Furthermore, the authors would have liked to do a between discipline analysis to determine if there are any systematic differences across profession type, however, were unable to do so due to the sample size. A large sample size of each of the professions would be beneficial in future research in order to achieve these between discipline analyses. It would be beneficial to further investigate practitioner differences to develop educational programs targeting the specific needs of the various professions. Finally, this study only engaged practitioners in NSW, and it would be prudent to examine the approaches practitioners take country wide. Whilst the different states of Australia have different driver licensing agencies and therefore requirements, the Austroads medical fitness to drive guidelines are the same across the country. It would be beneficial to determine if there are any systematic differences between the states to make informed decisions on best procedure and practice. Finally the addition of further questions related to any cut-off scores practitioners used to make their determination of “fit to drive” or “unfit to drive” would be beneficial. This would enable understanding of not only the tests that they use to make their determinations but also the criteria the patient needs to meet.

Conclusions

Medical and allied health practitioners consistently report that the current guidelines regarding assessment of fitness to drive are not sufficient to enable them to reliably make this decision and that moving forward a more objective, multidisciplinary approach needs to be adopted. Future research therefore is required to investigate the most appropriate objective assessment tool for clinical use. Furthermore, in this study due to the overwhelming lack of professional development practitioners have received, there needs to be a focus on the development and implementation of appropriate educational and training programs. Of note, the perspectives expressed in this paper are from a small sample and a variety of practitioners based solely in NSW, and so it is crucial to continue this research in a more representative national sample to determine if these opinions are felt by the majority of practitioners. This study does however highlight the call for continual work into the implementation of education and an in-office objective assessment tool. If these aims are achieved, practitioners will be able to make better informed decisions on driving capacity for people with dementia which balances individual independence with overall community safety.

Acknowledgements

Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

References

- Alzheimer’s Australia (2016). *Driving and Dementia*. Discussion Paper 18, November 2016. Retrieved from <https://nsw.fightdementia.org.au/files/NSW/documents/Discussion%20Paper%20Driving%20and%20Dementia.pdf>
- Austroads (2012). *Assessing Fitness to Drive for Commercial and Private Vehicle Drivers*. Retrieved from <https://www.onlinepublications.austroads.com.au/items/AP-G56-13>
- Austroads (2016). *Assessing Fitness to Drive for Commercial and Private Vehicle Drivers*. Retrieved from <https://www.onlinepublications.austroads.com.au/items/AP-G56-16>
- Bennett, J. M., Chekaluk, C., & Batchelor, J. (2016). Cognitive tests and determining fitness to drive in dementia: A systematic review. *Journal of the American Geriatrics Society*, 64(9), 1904-1917. doi:10.1111/jgs.14180
- Breen, D. A., Breen, D. P., Moore, J. W., Breen, P. A., & O Neill, D. (2007). Driving and dementia. *British Medical Journal*, 334, 1365-1369. doi: 10.1136/bmj.39233.585208.55
- Carmody, J., Traynor, V., & Iverson, D. (2012). Dementia and driving: An approach for general practice. *Australian Family Physician*, 41(4), 230-233.
- Carr, D. B., Duchek, J. M., Meuser, T. M., & Morris, J. C. (2006). Older adult drivers with cognitive impairment. *American Family Physician*, 73(6), 1029-1034.

- Carr, D. B., & O'Neill, D. (2015). Mobility and safety issues in drivers with dementia. *International Psychogeriatrics*, 27(10), 1613-1622. doi:10.1017/S104161021500085X
- Carr, D. B., & Ott, B. R. (2010). The older adult driver with cognitive impairment: "It's a very frustrating life." *Journal of the American Medical Association*, 303, 1632-1641. doi:10.1001/jama.2010.481.
- Jang, R. W., Man-Son-Hing, M., Molnar, F. J., Hogan, D. B., Marshall, S. C., Auger, J., . . . Naglie, G. (2006). Family physicians' attitudes and practices regarding assessments of medical fitness to drive in older persons. *Journal of General Internal Medicine*, 22(4), 531-543. doi: 10.1007/s11606-006-0043-x
- Jones, K., Rouse-Watson, S., Beveridge, A., Sims, J., & Schattner, P. (2012). Fitness to drive: GP perspectives of assessing older and functionally impaired patients. *Australian Family Physician*, 41(4), 235.
- Lincoln, N., & Radford, K. (2014). A shortened version of the dementia drivers' screening assessment. *International Journal of Therapy and Rehabilitation*, 21(6), 268-273. doi: 10.12968/ijtr.2014.21.6.268
- Lipski, P. S. (2002). A survey of general practitioners' attitudes to older drivers on the New South Wales central coast. *Australasian Journal on Ageing*, 21(2), 98-100.
- Lyman, S., Ferguson, S.A., Braver, E.R., & Williams, A.F. (2002). Older driver involvements in police reported crashes and fatal crashes: Trends and projections. *Injury Prevention*, 8(2), 116-120. doi:10.1136/ip.8.2.116
- McKhann, G. M., Knopman, D. S., Chertkow, H., Hyman, B. T., Jack Jr, C. R., Kawas, C. H., . . . Phelps, C. H. (2011). The diagnosis of dementia due to Alzheimer's disease: Recommendations from the National Institute on Aging-Alzheimer's Association workgroups on diagnostic guidelines for Alzheimer's disease. *Alzheimer's & Dementia*, 7(3), 263-269. doi:10.1016/j.jalz.2011.03.005
- Meuser, T. M., Carr, D. B., Unger, E. A., & Ulfarsson, G. F. (2015). Family reports of medically impaired drivers in Missouri: Cognitive concerns and licensing outcomes. *Accident Analysis & Prevention*, 74, 17-23. doi: 10.1016/j.aap.2014.10.002
- Molnar, F. J., Byszewski, A. M., Rapoport, M., & Dalziel, W. B. (2009). Practical experience-based approaches to assessing fitness to drive in dementia. *Geriatric Aging*, 12(2), 83-92.
- Moorhouse, P., Hamilton, L., Fisher, T., & Rockwood, K. (2011). Barriers to assessing fitness to drive in dementia in Nova Scotia: Informing strategies for knowledge translation. *Canadian Geriatrics Journal*, 14(3), 61-65. doi: 10.5770/cgj.v14i3.7
- Omer, S., Dolan, C., Dimitrov, B. D., Langan, C., & McCarthy, G. (2014). General practitioners' opinions and attitudes towards medical assessment of fitness to drive of older adults in Ireland. *Australasian Journal on Ageing*, 33(3), E33-E38. doi: 10.1111/ajag.12045
- Ott, B. R., Festa, E. K., Amick, M. M., Grace, J., Davis, J. D., & Heindel, W. C. (2008). Computerized maze navigation and on-road performance by drivers with dementia. *Journal of Geriatric Psychiatry and Neurology*, 21(1), 18-25. doi: 10.1177/0891988707311031
- Perkinson, M. A., Berg-Weger, M. L., Carr, D. B., Meuser, T. M., Palmer, J. L., Buckles, V. D., Powlishta, K. K., Foley, D. J., & Morris, J. C. (2005). Driving and dementia of the Alzheimer type: Beliefs and cessation strategies among stakeholders. *The Gerontologist*, 45(5), 676-685. doi: 10.1093/geront/45.5.676
- Piersma, D., de Waard, D., Davidse, R., Tucha, O., & Brouwer, W. (2016). Car drivers with dementia: Different complications due to different etiologies? *Traffic Injury Prevention*, 17(1), 9-23. doi: 10.1080/15389588.2015.1038786
- Prince, M., Bryce, R., Albanese, E., Wimo, A., Ribeiro, W., & Ferri, C. P. (2013). The global prevalence of dementia: A systematic review and metaanalysis. *Alzheimer's & Dementia*, 9(1), 63-75.e62. doi:10.1016/j.jalz.2012.11.007
- Rapoport, M. J., Naglie, G., Herrmann, N., Zucchero Sarracini, C., Mulsant, B. H., Frank, C., . . . Molnar, F. (2014). Developing physician consensus on the reporting of patients with mild cognitive impairment and mild dementia to transportation authorities in a region with mandatory reporting legislation. *The American Journal of Geriatric Psychiatry*, 22(12), 1530-1543. doi: 10.1016/j.jagp.2013.12.002
- Rapoport, M. J., Chee, J. N., Carr, D. B., Molnar, F., Naglie, G., Dow, J., Marottoli, R., . . . O'Neill, D. (2018). An international approach to enhancing a national guideline on driving and dementia. *Current Psychiatry Reports*, 20(16), 1-9.
- Seiler, S., Schmidt, H., Lechner, A., Benke, T., Sanin, G., Ransmayr, G., . . . & Eggers, C. (2012). Driving cessation and dementia: Results of the prospective registry on dementia in Austria (PRODEM). *PLoS one*, 7(12), e52710. doi: 10.1371/journal.pone.0052710
- Sims, J., Rouse-Watson, S., Schattner, P., Beveridge, A., & Jones, K. M. (2012). To drive or not to drive: Assessment dilemmas for GPs. *International Journal of Family Medicine*, 2012. doi: 10.1155/2012/417512
- Snellgrove, C. A., & Hecker, J. R. (2002). Driving and dementia: General practitioner attitudes, knowledge and self-reported clinical practices in South Australia. *Australasian Journal on Ageing*, 21(4), 210-212. doi: 10.1111/j.1741-6612.2002.tb00449.x
- Wilson, S., & Pinner, G. (2013). Driving and dementia: A clinician's guide. *Advances in Psychiatric Medicine*, 19, 89-96. doi: 10.1192/apt.bp.111.009555