Mobility and safety issues in drivers with dementia

David B. Carr  
*Washington University School of Medicine in St. Louis*

Desmond O'Neill  
*Tallaght Hospital and Trinity College Dublin*

Follow this and additional works at: https://digitalcommons.wustl.edu/open_access_pubs

Please let us know how this document benefits you.

**Recommended Citation**

https://digitalcommons.wustl.edu/open_access_pubs/4895
REVIEW

Mobility and safety issues in drivers with dementia

David B. Carr1 and Desmond O’Neill2

1Division of Geriatrics and Nutritional Science, Department of Medicine and Neurology, Washington University in St. Louis, 660 Euclid Dr. St. Louis, MO 63110, USA
2Tallaght Hospital and Trinity College Dublin, Trinity Centre for Health Sciences, Tallaght Hospital, Dublin 24, Ireland

ABSTRACT

Although automobiles remain the mobility method of choice for older adults, late-life cognitive impairment and progressive dementia will eventually impair the ability to meet the transport needs of many. There is, however, no common utilized method of assessing dementia severity in relation to driving, no consensus on the specific types of assessments that should be applied to older drivers with cognitive impairment, and no gold standard for determining driving fitness or approaching loss of mobility and subsequent counseling. Yet, clinicians are often called upon by patients, their families, health professionals, and driver licensing authorities to assess their patients’ fitness-to-drive and to make recommendations about driving privileges. We summarize the literature on dementia and driving, discuss evidenced-based assessments of fitness-to-drive, and outline the important ethical and legal concerns. We address the role of physician assessment, referral to neuropsychology, functional screens, dementia severity tools, driving evaluation clinics, and driver licensing authority referrals that may assist clinicians with evaluation. Finally, we discuss mobility counseling (e.g., exploration of transportation alternatives) since health professionals need to address this in portant issue for older adults who lose the ability to drive. The application of a comprehensive, interdisciplinary approach to the older driver with cognitive impairment will have the opportunity to enhance our patients’ social connectedness and quality of life, while meeting their psychological and medical needs and maintaining personal and public safety.

Keywords: older adult, dementia, Alzheimer’s disease, cognitive impairment, driving, automobile, transportation, assessment

Introduction

Driving is the most important method of transportation across the lifespan. In 2009, there were 33 million licensed drivers over the age of 65 years in the US (USD Department of Transportation, 2010) and 40,000,000 drivers over age of 70 years in the UK (BBC News, September 2013). Progressive disease that impairs driving in older adults has at least two serious adverse outcomes: injury or death from a motor vehicle accident (MVA) or driving cessation. However, older drivers are the safest demographic group in terms of crashes per year and older drivers with medical conditions relevant to driving are also safer than younger groups with medical conditions relevant to driving (Redelmeier et al., 2012; Papa et al., 2014). This occurs despite higher levels of multimorbidity, and points to factors in addition to reduced exposure as yet inadequately described such as prudence and wisdom, which may mediate the impact of multiple illnesses on driver safety. However, older adults aged 70–74 years will be dependent on alternative sources of transportation for about seven years and for women about 10 years after stopping driving (Foley et al., 2002). Sharp declines in health have been associated with loss of mobility in older adults (Edwards et al., 2009). The US due to its size and rural geographic areas makes transportation options for older adults especially challenging when compared to European countries that may have more developed and cost-effective public transportation systems. Thus, developed countries will be increasingly faced with an increased transportation burden and need from their elders.

Dementia and specifically common neurodegenerative diseases such as Alzheimer’s disease (AD) likely contribute to both issues of traffic safety and loss of mobility. Perhaps, 4% of current drivers over age 75 years have a dementia (Foley et al., 2000) and many of older adults continue to drive well into the disease process (Odenheimer, 1993). In a study where older adults were administered a well-validated brief cognitive screen to detect dementia (e.g., the Short Blessed Test) (Katzman et al., 1983),
nearly 20% of those over age 80 years failed (Stutts et al., 1998). The province of Ontario in Canada estimates that they will have over 100,000 drivers with dem entia on the road by 2,028 (Hopkins et al., 2004). These studies probably underestimate the actual number of drivers with dem entia on the road, since some older adults with memory loss continue to drive even after they are reported to have stopped or even if they failed to renew their licenses.

In this review, we present an evidenced-based approach to the evaluation, assessment, and counseling of older drivers with cognitive impairment. We review studies that have examined functional abilities and traffic skills in drivers with dem entia, identify co-morbidities that can further reduce driving competence, examine options for driving evaluation, and finally, discuss key aspects of mobility counseling to inform patients of transportation alternatives.

Definitions

Mild cognitive impairment (MCI) (termed “mild neurocognitive disorder” under the DSM-5 classification) is a syndrome defined by one or more abnorm alities in a specific cognitive domain (e.g. memory, executive function), a deviation from the norm on a standardized psychometric test related to the same, and usually the absence of significant impair ment in daily activities (Albert et al., 2011). Two preliminary studies indicate there may be possible in MCI in driving skills MCI (Fratelli et al., 2009; Wadley et al., 2009). However, one study combined dem entia and MCI together which makes interpretation of the analysis difficult and the other showed less than optimal performance rather than severe in MCI. More research is needed on MCI. The diagnosis relies on a detailed and controversial since definitions may vary as to what level of intermittent or very mild functional impairment is allowed, if at all. In addition, many patients obviously fit a phenotype of early AD, even if they do not yet have definite functional impairment.

In contrast, dem entia (termed “m ajor neurocognitive disorder” under the DSM-5 classification) is manifest by the onset of impairment in a specific domain (e.g. memory in the most common form of this syndrome), requires the presence of impair ment in an additional cognitive domain (e.g. attention, executive function), and the deficits cause significant impair ment in social and occupational functioning. Formal criteria to diagnose MCI, dem entia, and specifically AD have recently been updated (McKhann et al., 2011) and have now been placed under the category of Neurocognitive Disorders in the DSM-5 manual (16).

Dem entia and driving outcomes

There are two major outcomes of importance in studying the impact of dem entia on driving: mobility and safety. It is clear that one of the most devastating consequences of dem entia is eventual loss of mobility (driving cessation), and loss of mobility in dem entia is associated with mismatch between transportation needs and available resources. This important issue is discussed later in this paper. One key outcome relevant to driving safety is a crash causing injury or death, but a challenge of this outcome is the relative infrequency of crashes. In general, most studies have documented a 2–5-fold increase in crash rate compared to age-matched controls (>70+ years), although two studies have documented no differences (Car et al., 2010).

Performance-based road tests are often used as a measure of driving competence. The majority of studies report on qualitative outcomes (e.g. “pass/fail” rates) in comparison to controls, but some studies have tracked specific types of errors (Odenheimer et al., 1994; Hunt et al., 1997). Drivers with dem entia have been documented to have particular difficulties with lane checking and changing, merging, left turns, signaling to park, and route following (Akhwantan et al., 2005). The Clinical Dementia Rating (CDR), a global measure of dem entia severity, uses a semistructured interview and exam to rate the severity of the dem entia (Morris, 1993). Pooled data from two longitudinal studies involving a total of 134 individual drivers with dem entia (Duchek et al., 2003; Ott et al., 2008b) reveal that 88% of drivers with very mild dem entia (CDR = 0.5) and 69% of drivers with mild dem entia (CDR = 1.0) were still able to pass a formal road test.

In driving simulation studies, drivers with AD in general perform more poorly than do controls without dem entia (Rizzo et al., 2001; Freund et al., 2002) and are more likely to drive off the road, and drive more slowly than the speed limit (Cox et al., 1998). Studies from the National Advanced Driving Simulator at the University of Iowa noted that slow or inappropriate responses were major factors leading to simulator accidents (Rizzo et al., 2001).

The majority of studies on dem entia and driving have focused on AD; however, other degenerative dem entias are not uncommon and may impact driving fitness. Indeed, pure dem entia syndromes are less common in advanced age justifying the
Evaluating mobility and driving safety

A preliminary enquiry to all patients who are being assessed for memory disorders and as to whether or not they drive is an important first step in clarifying the impact of dementia on both mobility and safety. The clinical opinion of a primary care physician or subspecialist, evidence of a recent crash, new onset of impaired driving behaviors noted by caregivers, decline in key cognitive domains (e.g., attention, visuospatial skills), in-pain at higher order level (executive function), activities of daily living, in-pain at in perform ance-based evaluations such as road tests, and difficulty with simulator scenarios have all been used in various settings. Risk stratify or assess fitness-to-drive in individuals with a dementia illness. There is no accepted gold standard for an approach to assessing driving safety, although two recent evidence-based reviews provide clinicians som e guidelines based on dementia and driving studies in the literature (Carr and Ott, 2010; Iverson et al., 2010).

A useful approach for clinicians that are providing fitness-to-drive recommendation in older adults with a dementia illness should consider the following three steps: (a) confirming a diagnosis and treating reversible causes for cognitive decline (e.g., sleep apnea, discontinuing sedating medications); (b) rating the severity of the dementia; and (c) identifying additional co-morbidities that have the potential to further decrease the ability to operate an automobile. Additional queries could focus on identifying any decen ts in driving behavior that have occurred during the course of the dementia illness, inquire about the new onset of in pain at higher order instrumental activities of daily living which could be a proxy for impaired driving in pain at, and to document the presence of specific cognitive domains (e.g., attention, visuospatial skill) that have been associated with impaired driving outcomes via psychometric testing.

Although some individuals with dementia have consistent difficulty in driving situations, many pacientes are still able to pass a driving performance test and are likely still relatively safe to drive. One caveat that should be considered is that simply having a diagnosis of dementia should not be the sole justification for the revocation of a driver's license (Iverson et al., 2010). However, with any new diagnosis of a progressive neurodegenerative dementia, clinicians should immediately begin a conversation about the inevitability of future driving cessation. This discussion should include mobility counseling (a discussion of transportation alternatives and/or barriers to cessation). These discussions should be repeated with both the patient and caregiver to reduce the possibility of resistance or non-compliance with future recommendations.

Clinician evaluations

Family members have expressed their desire or wish that physicians provide guidance in this area (Perkinson et al., 2005). Thus, the primary care physician or subspecialist may be the opinion available or acceptable to the patient, caregiver, or community in regards to fitness-to-drive in an older adult with dementia. In one study, most accurate were clinicians specially trained in dementia assessment (Ott et al., 2005).

Professional guidelines and consensus statements

Consensus among national medical, transportation, and elder advocacy societies is that drivers with moderately severe dementia should not drive. Unfortunately, clinicians are rarely taught how to assess dementia severity and would be hard pressed to quantify or rate patients with a moderate or severe dementia. The CDR, used in research than in clinical practice, takes specialized training and often takes 45 minutes or more to complete, rendering it often in practical form in any office settings. Although there are limitations to the use of psychometric testing in assessing dementia severity, specific scores on global psychometric cognitive screens or specific tests may give useful ranges that could place drivers in “at-risk” categories (see Table 1).

Co-morbidities and medications

The influence of multiple medical illnesses or co-morbidities on further impairing driving ability in
Table 1. Association of global cognitive screens and psychometric tests with dementia severity levels

<table>
<thead>
<tr>
<th>CL IN IC A L ME AS U R E O F DE ME NT IA SEVERITY</th>
<th>QUESTIONABLE OR V ERY M I LD DEMENTIA</th>
<th>M I LD DEMENTIA</th>
<th>M OD ERATE TO SE ME RSE DEMENTIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO DEMENTIA (CDR = 0)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QUESTIONABLE OR V ERY M I LD DEMENTIA (CDR = 0.5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M I LD DEMENTIA (CDR = 1.0)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MODERATE TO SEVERE DEMENTIA (CDR = 2.0)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For the Dem entia Specialist:

<table>
<thead>
<tr>
<th>Cognitive domain</th>
<th>N (SD)</th>
<th>N (SD)</th>
<th>N (SD)</th>
<th>N (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory loss or inconsistent memory loss</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fully oriented</td>
<td>12.1 (1.9)</td>
<td>4.8 (5.9)</td>
<td>15.4 (5.2)</td>
<td>18.5 (5.5)</td>
</tr>
<tr>
<td>Judge ment intact</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Function intact</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal care intact</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For the Clinician:

<table>
<thead>
<tr>
<th>Psychometric test</th>
<th>N (SD)</th>
<th>N (SD)</th>
<th>N (SD)</th>
<th>N (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short Blessed test</td>
<td>28.9 (1.3)</td>
<td>23.1 (2.5)</td>
<td>20.3 (3.9)</td>
<td>16.1 (4.7)</td>
</tr>
<tr>
<td>Mini Mental State Examination</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For the Psychologist:

<table>
<thead>
<tr>
<th>Cognitive domain</th>
<th>N (SD)</th>
<th>N (SD)</th>
<th>N (SD)</th>
<th>N (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logical memory</td>
<td>8.8 (2.9)</td>
<td>4.3 (2.7)</td>
<td>1.9 (1.7)</td>
<td>1.5 (2.3)</td>
</tr>
<tr>
<td>Block design</td>
<td>30.1 (8.6)</td>
<td>22.2 (9.8)</td>
<td>12.0 (9.6)</td>
<td>3.2 (6.6)</td>
</tr>
<tr>
<td>Digits symbol</td>
<td>45.6 (11.5)</td>
<td>31.7 (13.6)</td>
<td>17.0 (13.3)</td>
<td>8.3 (8.7)</td>
</tr>
<tr>
<td>Trail making test A</td>
<td>40.9 (20.0)</td>
<td>70.2 (39.2)</td>
<td>108.3 (50.5)</td>
<td>N ot available</td>
</tr>
<tr>
<td>Trail making test B</td>
<td>81.5 (36.1)</td>
<td>136.0 (78.0)</td>
<td>190.8 (81.6)</td>
<td>N ot available</td>
</tr>
<tr>
<td>Benton copy</td>
<td>9.6 (8.8)</td>
<td>9.1 (1.6)</td>
<td>7.3 (2.7)</td>
<td>N ot available</td>
</tr>
</tbody>
</table>

(Based on samples that average 75 years of age and 14 years education)

From Johnson et al. (2009), Hill et al. (1992), Kanne et al. (1998), Kem per et al. (1993), Morris et al. (1989), Noorhashemi et al. (2008).

Patients with dementia has not been well studied, but should be considered when evaluating driving competency. A comprehensive publication in the past five years summarizes the extensive literature on medical conditions and crash risk (Charlton et al., 2010). However, many medical conditions have not been studied.

Medical conditions that are age-related and associated with impaired driving ability— but which also hold the potential for remediation— include: diseases affecting vision (e.g., macular degeneration, glaucoma, cataracts); cardiovascular diseases (e.g., in plantable defibrillators, arrhythmias); respiratory diseases (e.g., COPD, sleep apnea); neurologic diseases (e.g., AD, multiple sclerosis, stroke, Parkinson disease); psychiatric diseases (e.g., psychosis, anxiety, depression); metabolic diseases (e.g., hyper or hypoglycemia); and musculoskeletal diseases (e.g., cervical arthritis with restrictive range of motion). Medical conditions should be reviewed and sedating drugs discontinued if safer alternatives exist. It has been difficult to consistently show associations between some drug classes and driving in pain ent. The gap between theoretical and real risk has recently been illustrated in a major European study, which showed reduced crash risk with antihistamines and another that showed only significant risk with the use of benzodiazepines (Orriols et al., 2009). Yet, a recent evidence-based review did find many associations of driving in pain ent with certain medications and those should be avoided or minimized when operating a motor vehicle especially in older adults with cognitive in pain ent: sedating antihistamines, antidepressants, tricyclic antidepressants, antipsychotics, muscle relaxants, and narcotics (Hetland and Carr, 2014).

Psychometric tests

Studies regarding the utility of global cognitive measures like Mini Mental State Examination (MMSE) for estimating driving in pain ent have been mixed (Fitten et al., 1995; Leskar et al,
Although the M M SE may correlate with degree of driving impairment on road tests and history of crashes, it does not appear to predict future involvement in crashes and valid cut-off scores have not been defined (M olnar et al., 2006). Given its limitation in predicting performance, we do not recommend the M M SE for determining driving privileges. However, these scores can provide a rough estimate of dementia severity and possible at-risk driving (e.g. need for further assessment) given known limitations for race, education, sensory deprivation, etc.

In 2004, a meta-analysis of neuropsychological tests of driving performance in patients with dementia concluded that tests of visuospatial skills are the most relevant predictor of driving impairment (Reger et al., 2004). More recently, visuospatial and executive function tests such as Trail Making Tests and maze completion (Welsh et al., 2005; Ott et al., 2008a) have been associated with driving in patients with dementia. One study that evaluated a dementia education program modeled after the American Medical Association older driver curriculum suggested that physicians may be willing to adopt such tests (M euser et al., 2006). Psychomotor tests may serve to identify drivers at risk (e.g. those that may warrant further evaluation by a performance-based road test), but should not be the sole determinant in deciding to continue or revoke driving privileges (Freund, 2006; Molnar et al., 2006). This was recently confirmed in an article showing the lack of predictive value for prospective crashes in older adults that completed the M M SE (Joseph et al., 2014).

However, some recognize that standard clinical psychomotor tests have little congruence with modern models of driving behavior (Fuller, 2005) and a number of innovative approaches have been developed which seek to draw on these insights, including the Adelaide Driving Self-Efficacy Scale (George et al., 2007) and a scale of strategic and tactical compensation outlined by de Raedt in 2000 (de Raedt and Ponsjaert-Kristoffersen, 2000). However, neither of these approaches has yet been tested for utility with drivers with dementia.

**Referral**

In the absence of a gold standard or consensus for determining driving competency, clinicians may request assistance from a driving clinic or refer to other subspecialists in the community such as a geriatrician, psychiatrist, neurologist, or neuropsychologist. A Driver Rehabilitation Specialist (D R S) evaluates, develops, and implements driving services for individuals with disabilities. D R Ss in the US are often occupational therapists with additional training in driver evaluation, vehicle modification, and rehabilitation. Occupational therapy practice guidelines for these evaluations have been published, but a recent review of practices across the US and Canada indicates assessment vary significantly across programs and few have adopted standardized tools (Komer-Blenesky et al., 2005). A European project found similar results (Middleton et al., 2005). In addition, there are relatively few D R Ss trained and available in smaller communities.

A driving evaluation in the US costs approximately $350–$800 and is generally an out-of-pocket expense, but the situation varies in other countries. Clinicians who are interested in this service can contact the occupational therapy departments in local hospitals or rehabilitation centers or the A D E D directory (see, online Web resources). Many local chapters of the Alzheimer’s advocacy organizations (such as the Alzheimer’s Association in the USA) may provide referral sources for area driving evaluation programs.

A performance-based road test for drivers with dementia could be considered to assist with risk stratification when; (a) there is observation of new in-patient events in traffic skills (e.g. near misses, failure to scan, etc.), (b) prominent in-patient events in key cognitive domains (e.g. attention, executive function, visuospatial skills), and/or (c) the presence of a mild dementia severity rating ( C D R = 1). Private or university-based driving clinics may not be available to everyone, but many driver licensing authorities can provide or facilitate on-road tests: in the USA, every state Department of Motor Vehicles (DM V) conducts such tests. In Europe, there is a much broader range of options through state, not-for-profit, and private organizations (Sanders et al., 2006).

A review of this topic concluded there was no evidence to demonstrate the benefit of driving evaluations with respect to the preservation of mobility or a reduction in crashes (Martin et al., 2009). Yet, a recent longitudinal study noted crash rates for drivers with dementia declined to the levels of healthy control drivers during a period of 3 years when evaluated with road tests every 6 months (Ott et al., 2008b). This finding was probably due to the removal of AD drivers who had failed road tests and were no longer driving and/or to changes in behavior of AD drivers who continued to drive.

**Mobility counseling**

Patients may stop driving based on physician advice (Persson, 1993). There is little data to suggest that
clinicians should recommend reducing exposure in patients with dementia (e.g., limiting trips) or mandating a co-pilot to significantly reduce driving risk. In fact, data would suggest the older drivers at highest risk for a crash are the infrequent drivers that are on the road less than 3,000 km (2,000 miles) a year (Langford et al., 2006). Two recent education interventions for health professionals were positively associated with improving communication when discussing driving with patients with dementia and for using tools that might be helpful in the assessment process (Byssewski et al., 2003; Muser et al., 2006).

Driving cessation has been associated with a decrease in social integration (Mauk and Rebok, 2008), decreased out-of-home activities (Marotelli et al., 2000), an increase in depressive and anxiety symptoms in the elderly (Fonda et al., 2001), and an increased risk of nursing home placement (Freeman et al., 2006). Thus, a recommendation to stop driving should not be taken lightly by the clinician. Often, the situation is not urgent and there is time to work through the process of mobility loss. The brochures "We Need to Talk" and "At the Crossroads" from The Hartford Foundation (see Web resources) could enhance communication with the patient, their family, and their clinicians and assist the patient and the family members to reach important driving decisions and maintain linkage with key destinations. Educational interventions with these materials and group meetings may be effective ways to prepare caregivers for dealing with this difficult issue (Stein et al., 2008). Referral to social workers or gerontological care managers may provide in-patient local and regional transportation options. Caregiver support groups for families also have proven efficacy with driving cessation (Dobbs et al., 2009). Finally, the Independent Transportation Network (ITN) America is a model program that assists seniors with transportation to needed destinations and now has many sites across the U.S. (see Web resources).

The physician’s legal and ethical obligations

Many physicians are uncertain of their legal responsibility to report unsafe drivers to the state or local licensing authorities (Miller and Morley, 1993; Kelly et al., 1999). In Europe, all jurisdictions rely on reporting by the driver or family, with third-party reporting the exception from a physician. The American Medical Association's policy states, "in situations where clear evidence of substantial driving in pain or illness is strong, it is desirable and ethical to notify the DMV" (American Medical Association, 1999). Obviously, it is preferred that referrals to the license authority be done with the patient's knowledge, and that the report be documented in the medical record. However, many primary care physicians, fearing the deterioration of a long-standing relationship with their patients, may be reluctant to do this forthwith. If a physician decides to report an unsafe driver, most jurisdictions in the U.S. will accept a formal letter.

Physicians may be in a "double bind," concerned that they will be liable for breach of confidentiality, but also fearing legal action if they fail to report an unsafe cognitively impaired driver who is involved in an injurious crash. Most legal experts hold on the side of reporting where the physician believes that the patient and community are at high risk for a crash. Since laws and regulations on driving often change, clinicians should review their laws, statutes, and regulations in their own jurisdiction to determine current requirements. Development of specific policies regarding reporting should be vetted by legal advice. In jurisdictions with voluntary reporting laws, we recommend formal referral to the driver licensing authority for refractory cases or for those patients deemed to be at a very high risk for a crash and/or injury.

Studies are needed to compare the benefits and costs of mandatory reporting to driver licensing authorities with voluntary reporting, although studies in other illnesses are not supportive of mandatory reporting (McLachlan et al., 2007). Decision analysis studies have not shown the benefits of systematized screening and evaluating drivers with dementia (Retchina and Hillner, 1994; Leproust et al., 2008). Some studies have noted positive impact on driving of cognitive stimulation (Edwards et al., 2005) and exercise interventions on older adults (Mar et al., 2009), although these studies were not performed in patients with dementia. Intervention studies are needed in the earliest stages of the disease to determine whether driving could be maintained safely. As the baby boom generation comes of age, there will be a pressing need to develop comprehensive interventions to maintain driving life expectancy and to develop alternative transportation systems for our cognitively impaired older drivers. The new era of smart cars and smart roads may be of assistance to those older adults with cognitive and/or physical frailty as they try to navigate down the road in the future.

Conflict of interest

Dr. Carr has support from the NIA, Missouri Department of Transportation Division of Traffic.
and Highway Safety. He has been a paid consultant for the American Medical Association. A D EPT, T IRF, and M escape in the past two years. Prof. O’Neill is Director of the National Program Office for Traffic Medicine, Ireland.

Description of authors’ roles
Each author wrote paragraphs, reviewed the literature, and modified each other’s contributions.

Web Resources on Dementia and Driving (All accessed 04/12/15)

1. General guidelines for the clinician that include dementia and additional medical conditions
   a. C M A Fitness to Drive
      https://www.cm.ca/en/Pages/drivers-guide.aspx
   b. A USTRALIA Fitness to Drive
   c. Irish Medical Guidelines
   d. A M A Older Driver Curriculum on AGS website

2. For difficult cases, consider referring to a driving rehabilitation specialist
   a. AOTA
      http://www.yaota.ota.org/driver_search/index.aspx
   b. A society of D riving Rehabilitation Specialists: A D E P T

3. For refractory cases, consider referral to D agencies of Revenue or your Country’s Licensing Authority
   a. Summary of United States Guidelines
      http://www.irsen.ie/docs/topics/laws/olderdrivers/top-10-an-e-older-drivers

4. Consider Web Resources and Office H andouts
   a. We Need to Talk and At the Crossroads
      http://www.thehardtblog.com/inature-m arket-excellence/publications-on-aging
   b. Alzheimer’s Association: Dementia and Driving Resource Center

5. Transportation Alternatives: Social Workers, Case Managers or Local Area on Aging.

References


