Driving and dementia: a clinical update for mental health professionals

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Contribution to the new EBMH section: Old age psychiatry

ABSTRACT

Most people with mild dementia can continue to drive, but dementia is progressive and many patients and clinicians will be faced with questions about driving safety in the course of their illness. Determining when this happens is a complex decision, with risks of personal and public safety needing to be weighed against individual patient benefits of driving in terms of autonomy, independence and well-being. Decisions need to make reference to cognitive abilities, as well as other factors including physical comorbidity, vision, mobility, insight and history of driving errors and accidents. Deciding to stop driving, or being required to stop driving is often difficult for patients to accept and can be a particularly problematic consequence of a dementia diagnosis. Legal frameworks help in decision-making but may not provide sufficient detail to advise individual patients. We review the current guidelines and evidence relating to driving and dementia to help clinicians answer questions about driving safety and to consider the full range of assessment tools available.

Clinical review

INTRODUCTION

We are becoming ever more dependent on driving; in 2014 81% of people aged 60–69 years and 62% of those over 70 years old in the UK held a full driving licence.[1] At the same time, the number of people with dementia is predicted to rise to over 1 million in the UK by 2025 (Alzheimer's Society, 2016),[2] and it is inevitable that there will be a rise in the number of drivers with dementia over the coming years. This article examines how the public risk posed by a driver with dementia can be balanced against the infringement on the patient's autonomy and well-being if they cease to drive.

Driving ability spans multiple cognitive domains and requires visuospatial skills, executive function, memory, attention and motor skills. By definition, dementia causes a progressive decline across multiple cognitive domains, but in the early stages of the disease some people are still able to drive safely. The challenge for a person with dementia, their family and healthcare professionals lies in judging when it would be appropriate for the patient to cease driving. This becomes a nuanced issue, especially if dementia progresses and causes loss of insight into cognitive deficits and associated driving risks. Giving up driving can be a major loss for a person with dementia and their family and may require major changes to the person's lifestyle.

People with dementia may get lost, go too slow[3] and not wear a seat belt;[4] there is evidence of an increased risk of multiple crashes in early dementia.[5] However, the true excess burden of road traffic accidents attributable to dementia is not known.[6] One of the confounding factors in epidemiological studies is that older drivers and drivers with medical problems regulate their own driving in order to minimise risk. For example, a person with dementia may feel safe driving with another adult in the car on a familiar route, but would not contemplate a longer trip to a new destination alone. Such strategies are recommended by the Alzheimer's Society (Driving and dementia factsheet, The Alzheimer's Society, 2013).[7] Although plausible, there appears to be no empirical evidence that restricted driving, on-board navigation systems, education programmes or having a 'co-pilot' reduces risk in dementia.[3] In fact, most driving errors may occur when people with dementia drive on a straight road which is not usually considered to be a highly challenging condition.[8]

Public opinion tends towards a negative view of older drivers, and there is a danger of overattribution of risk,[9] unfairly penalising those with dementia who experience serious negative consequences of losing their driving licence. These consequences are even more marked in areas with a dearth of public transport or without a strong support network of friends and family. This article offers clinicians pointers towards the assessment and management of driving in patients with dementia and focusses on how these risks are covered in UK law (table 1). Covering the legal requirements of countries globally is beyond the scope of this review, but the principles relating to driving assessment will be similar. The pertinent literature was identified using PubMed and Google Scholar until 14 August 2016.

Table 1 Useful links for patients, carers and mental health professionals

Sources of information for clinicians	
Driver Vehicle Licensing Authority (DVLA)	https://www.gov.uk/dementia-and-driving
Driving pathway for patients with dementia	http://research.ncl.ac.uk/driving-and-dementia/downloads/
Candrive, driving research for older adults	http://www.candrive.ca/
Sources of information for patients and carers	
DVLA	https://www.gov.uk/dementia-and-driving
Driving mobility (further information about driving courses and assessments)	http://www.drivingmobility.org.uk/
Alzheimer's Society factsheet: driving and dementia	https://www.alzheimers.org.uk/

What are the Driver and Vehicle Licensing Agency (DVLA) guidelines in relation to dementia and mild cognitive impairment?

Drivers must inform the DVLA of all diagnoses liable to affect their driving, for example, dementia.[10] Patients' have a responsibility to inform the DVLA themselves, but doctors can prompt and support them to do so.[9] The DVLA recognises that reaching the correct decision in relation to driving is challenging, and that further assessment is often needed.[10] Factors influencing fitness to drive include: poor short-term memory, disorientation, reduced attention and lack of insight. In early dementia, patients may retain the skills necessary to drive; if they are eligible to retain a driving licence, it will be renewed annually.

Patients diagnosed with mild cognitive impairment (MCI), do not need to inform the DVLA of the diagnosis, providing there is no likely driving impairment. If there is a possible driving impairment, they should inform the DVLA and have further assessment.[10]

Can clinicians predict fitness to drive?

Patients with moderate–severe dementia are unlikely to be fit to drive; in mild dementia, some people may retain skills needed for

driving.[6 11 12] Factors relevant to driving fitness include caregiver's report of unsafe driving, a history of driving offences and crashes, driving <60 miles per week and avoidance of challenging situations such as driving in the dark or in the rain, alcohol use, medications and comorbidity (eg, visual and motor impairment).[11] If multiple risk factors are present in someone with mild dementia, they are unlikely to be fit to drive. Clinicians may also consider the subtype of dementia, as driving risk may be greater in frontotemporal dementia, due to lack of critical insight and Lewy body dementia, particularly related to fluctuating consciousness and visual hallucinations,[13] but further research is needed in this area.[14]

It has been suggested that clinicians, particularly dementia specialists, possess the skill set for the 'complex and individualised assessment' required to predict fitness to drive.[15] Relatively few studies have investigated the accuracy of clinicians' predictions, and existing evidence is mixed. One study showed a significant correlation between a neurologist's prediction and results of the 'on-road driving test' outcome.[16] Other studies showed modest or limited agreement between clinician's predictions and the outcome of on-road tests.[17–21] Comparison of these studies is difficult as they are designed around people with differing dementia severity and use differing forms of clinical assessment and outcome measures. Although differing methodologies make it difficult to make direct comparisons between studies, in general, the on-road driving tests are shown to be superior to clinician assessment, and a combination of on-road tests and clinical and neuropsychological assessment is the most effective. Clinician errors lay in assessing people as fit to drive, who subsequently failed the on-road driving test.[19 20] Therefore, existing evidence suggests that clinicians are generally unable to predict driving ability accurately and reliably and that clinical assessment alone should not be used as a basis for decision-making.

Predictive accuracy can be increased by combining clinical history and neuropsychological tests (eg, trail making, visual construction and maze tasks),[21] and possibly by specialist assessments from clinicians specifically trained in dementia assessment.[17] Collateral history may add further valuable information to the clinical assessment. However, caregivers are often unable to predict the outcome of on the road driving tests accurately.[18] Their history may be biased by a wish to avoid conflict with the patient, due to concern about increased dependence of the patient on the carer, or due to dependence of the carer on the patient, who often is the carer's parent.[18]

Can cognitive tests help determine driving ability?

Driving depends on multiple aspects of cognitive function including attention, visuospatial skills and memory. While long-term procedural memory is unlikely to be compromised in dementia, impairment in other aspects of cognitive function can make driving unsafe. Given that multiple cognitive functions are necessary for driving, it is unsurprising that composite cognitive test batteries have been found to predict driving performance with greater accuracy than tests covering only a single cognitive domain.[22] Despite this, composite cognitive test batteries are still unable to provide a reliable assessment of driving safety. The predictive accuracy of composite cognitive tests can be increased by combination with other types of assessments, for example, driving simulator tests and a clinical interview.[21 22]

Screening tools such as the Mini-Mental State Examination (MMSE) and Montreal Cognitive Examination (MoCA)[23] do not correlate well with driving ability and should not be used to predict driving risk.[22 24] While low scores do not necessarily indicate high risk, and high scores do not reliably predict safe driving, they may be useful as part of a more detailed clinical assessment process. It has been suggested that a score of ≤24 on the MMSE should lead clinicians to consider recommending a driving evaluation,[25] and a score of ≤18 on the MoCA should alert clinicians to increased likelihood of significantly increased driving risk.[24]

A lack of validated cut-off scores for cognitive screening and more detailed cognitive testing hampers the clinical usefulness of these (and other) tools as part of routine driving assessment in front-line clinical practice.[26] Until more accurate cognitive tests are developed, assessment needs to focus on a much broader range of risk factors: type of dementia, cognitive status, age and severity of comorbidity are all independent factors associated with fitness to drive in patients with dementia.[27]

In summary, there are no cognitive tests that can accurately predict driving safety. Composite tests of memory, attention, and visuospatial and executive function may assist in the assessments of driving safety by helping to classify dementia severity, but there is no clear consensus on cut-off scores relevant to driving. Therefore, assessment of driving skill should not rely on cognitive tests alone.

What are the common factors influencing decisions to stop driving?

The decision to stop driving is likely to be relatively straightforward for patients who have moderate and severe dementia.[12] This decision is often made abruptly, in response to a physician's recommendation, particularly in those with lower cognitive scores and in those of more advanced age.[28] In patients with mild or mild–moderate dementia, decision-making will be more nuanced and may require a collaborative approach between patient, family and clinician. This provides time for further discussion regarding the risks and benefits of driving to help reach a mutual consensus on whether someone is safe to continue driving. Patients may identify cognitive changes that impair driving ability, such as reduced concentration, slowed reaction times and problems finding directions. Non-cognitive changes such as frailty, visual impairment, daytime sleepiness, mobility and head-turning ability may also influence the decision to stop driving.[29] Minor collisions or 'near misses' frequently reduce driving confidence and can be viewed as a warning shot in relation to driving safety. For many patients, these cognitive, physical and emotional factors need to be weighed against the benefits of driving in terms of convenience, independence and self-esteem. Family perspectives may provide an additional reason to cease driving (eg, if there is concern about risk) or to continue driving (eg, if family members are dependent on the patient for transport).

Specific clinical symptoms associated with dementia subtypes frequently influence decisions around driving safety. For example, lack of insight, agitation and disinhibition (eg, frontotemporal dementia), reduced mobility (eg, Parkinson's disease dementia) and medical comorbidities (eg, vascular dementia).[27] The specific diagnosis is less important than the abilities of an individual patient in terms of cognition, motor function and visuospatial abilities. Depressed mood and major depressive disorders may bias the patient towards giving up driving. When there are no immediate safety concerns, clinicians should help patients to reflect on the benefits and risks of driving, enabling them to make their own decisions where possible.

What happens when a patient informs the DVLA?

All patients with dementia who want to continue driving should inform the DVLA of their diagnosis. If there is no immediate concern, they can continue driving while they await DVLA review. They can also approach a local mobility centre for a driving assessment to support their application. A DVLA medical adviser will make the final decision about whether to retain or revoke a driving license. This decision is informed by the nature of the diagnosis and where applicable, a medical report, fitness to drive assessment and neuropsychological assessment. If a patient is deemed fit to drive, they will have an annual medical review by the DVLA. They can be educated to reduce their risk of accidents by

avoiding busy roads, driving in the day time only, keeping to familiar routes and avoiding driving in bad weather.[12]

In the majority of cases, clinicians can reach an agreement with their patients about driving. Only in a minority do clinicians need to inform regulatory bodies on behalf of patients, for example, when agreement on driving cannot be reached and a patient continues to drive when there are safety concerns. This is more likely for patients who are male, have an MMSE score between 10 and 19, and a diagnosis of frontotemporal or vascular dementia.[27] If a patient does not inform the DVLA, the doctor should remind them of their legal obligation; and if the patient still continues to drive without informing the DVLA, then doctors have a duty to inform the DVLA on their behalf.

What happens at a driving assessment centre?

Clinicians may refer patients for a driving assessment at 1 of 17 independent approved Driving Mobility Centres (http://www.drivingmobility.org.uk/). These centres offer driving assessments for all medical conditions, as well as assessments and advice about vehicle adaptations and aids to assist those with physical disabilities.

The fee for a driving assessment is between £50 and £130, depending on source of referral (Driving and dementia factsheet, The Alzheimer's Society, 2013).[7] The assessment, including office-based and on-road tasks, takes about 2 hours. The assessment is unlike a standard driving test and includes testing of reaction time and a discussion with an occupational therapist. During the on-road assessment, patients drive a dual control car on a variety of different roads on a predetermined route.[7] Many people taking the assessment are unused to driving unfamiliar cars in unfamiliar places and/or have not driven for a while; assessors take these factors into account when advising the DVLA. At the end of the assessment, the assessor discusses the outcome with the patient and offers advice (where appropriate) as to how the patient may continue driving safely.

These assessments, in particular the on-road assessment, are considered to be the 'gold standard' for assessing driving ability[13] and results of the on road assessment are well correlated with naturalistic driving performance.[30] However, the centres have limited capacity and due to the nature of the disease, those with dementia would require repeat assessments if found safe to drive at an assessment early in their illness. This may not be practicable or cost-efficient; hence, clinicians are often required to use proxy measures and reports from friends and family to determine a patient's fitness to drive.

Where assessment is available, it can be helpful for the person with dementia to have problems with their driving highlighted to help their insight and understanding of why they must retire from driving. Difficulties in the therapeutic relationship between doctor and patient can be minimised or even avoided, by using such an independent and objective driving assessment.

What impact does loss of the driving licence have on patients?

Practically, the loss of a driving licence may have a huge impact, in particular on patients living in rural communities and/or those with limited public transport.[15] Car ownership has been linked with psychosocial benefits, such as protection, autonomy and prestige.[31] Driving cessation can be seen as a double loss: that of role and of access to community resources.[32] Those who stop driving report negative feelings of dependency and loss of control over their lives and may have to give up previous leisure activities and family responsibilities.[32] Driving cessation is associated with increased depressive symptoms,[33] a decline in general physical health[34] and increased risk of entry to long-term care facilities and increased 3-year mortality.[33]

The decision to stop driving is often poorly handled. Although discussions of end-of-life planning and financial arrangements are difficult, these are more likely to have been addressed with their families than the issue of driving cessation.[28] Many people with dementia continue to drive after receiving a diagnosis, and driving cessation is typically abrupt and imposed by physicians or family members.[28] People with dementia would like to be the ones deciding when to stop driving,[25] but in many cases the person loses insight into their deficits before stopping driving. The burden of enforcing a decision to stop driving frequently lies with the spouse of the person with dementia, and they tend to welcome support from family and healthcare professionals[25] and definitive guidance from driving authorities.[35]

Key Points

- Clinicians are generally unable to predict driving ability accurately.
- Clinical assessment alone should not be used to determine driving ability.
- Individual cognitive tests and screening tools (e.g. MMSE or MoCA) do not provide a reliable assessment of driving safety.
- Composite tests of memory, attention, visuo-spatial and executive function may assist in the assessments of driving safety, but there is no consensus on cut-off scores relevant to driving.
- Combining clinical assessment, cognitive tests and an on-road driving test provides the most accurate assessment of driving ability.

CONCLUSIONS

It is important for clinicians and patients to recognise that a diagnosis of dementia does not mean that they automatically need to stop driving. Although patients with dementia have increased risks of accidents when driving, the regulatory framework only requires that the DVLA is informed of a new diagnosis of dementia. It is difficult for clinicians to predict the driving risk for individual patients and the DVLA uses a range of evidence in reaching the final decision about driving status. Although neuropsychological assessment can help inform this decision, cognitive testing alone does not provide a reliable assessment of driving safety. Cognitive testing can help to determine dementia severity and dementia subtype, and both will have a bearing on whether an individual is safe to drive. For example, patients with moderate–severe dementia are unlikely to be safe to drive, and someone with vascular dementia may have comorbidities that make driving more risky.

In addition to impaired cognition (particularly in the domains of memory, attention, visuospatial and executive function), other factors important in determining driving safety are as follows: vision, mobility, head-turning, day time sleepiness and motor skills. Knowledge of key elements that increase driving risk will help clinicians to have an informed discussion with patients about whether or not it is sensible for them to continue driving. Where this is in doubt an assessment of driving ability is very helpful. Where a person is deemed fit to drive, the risks associated with driving need to be reviewed annually. With commissioning and healthcare planning removing patients from specialist care shortly after diagnosis and initiation of treatment with acetylcholinesterase inhibitors, such decisions will be primarily left with general practitioners. For people who decide to stop driving, or are forced to stop, discussion about practical alternatives and the impact of this on them and their family will be important.

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Introduction to the new EBMH section Old Age Psychiatry

This review about "Driving and Dementia" is the first in a series of reviews and other papers covering psychiatry of the older age groups. As the title suggests, we will try to make these articles practically useful for the clinician. We will be open to suggestions from our readership both for submitted articles and the commissioning of new work covering a particular topic. To give you best value, we look forward to an interactive relationship. While there should be no special pleading for 'old age psychiatry', the field has been somewhat neglected scientifically (who wants a patient in their trial who could be affected by multimorbidity and blur the results?) and socially (it is the older generation who will be dependent on large numbers of immigrants to pay into and work for social and national insurance schemes to keep the generational contract going, while at the same time voting against immigration in large numbers!).

I am looking forward to a lively exchange of evidence in this section!

Klaus Ebmeier
EBMH Section Editor

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