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Family reports of medically impaired drivers in Missouri: Cognitive concerns and licensing outcomes

Thomas M. Meuser [a,1], David B. Carr [b,2], Elizabeth A. Unger [c], Gudmundur F. Ulfarsson [c,*]

[a] University of Missouri – St. Louis, Gerontology Program, School of Social Work, 133-134 Bellerive Hall, 1 University Blvd., St. Louis, MO 63121, USA
[b] Washington University School of Medicine, Department of Medicine and Neurology, 4488 Forest Park Blvd., St. Louis, MO 63108, USA
[c] University of Iceland, Civil and Environmental Engineering, Hjardarhagi 2-6, IS-107 Reykjavik, Iceland

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ABSTRACT

This study investigated reasons why older adults ($n = 689$) were reported to the Driver License Bureau, Missouri Department of Revenue, by family members as potentially unfit to drive with an emphasis on cognitive concerns and associated licensing outcomes. A total of 448 drivers were reported to have some cognitive issue; common symptoms included confusion, memory loss, and becoming lost while driving. Diagnostic labels (Alzheimer's disease (AD), cognitive impairment/dementia, brain injury/insult) were listed for 365 cases. A physician evaluation is required for license review. Of those with a diagnostic label, half (51%, $n = 187$) failed to submit this evaluation and almost all were de-licensed immediately. Of those evaluated by a physician, diagnostic agreement between family members and physicians was high for specific conditions (100% for AD, 97% for acute brain injury), and less so for cognitive impairment/dementia (75%). This latter finding suggests that physicians and family members may understand cognitive symptoms differently. Whether cognitively impaired or not, few family reported drivers in this sample (~2%) retained a valid license. Family members may be in the best position to recognize when medical-functional deficits impact on driving safety, and physicians and driver licensing authorities would do well to take their observations into account with respect to older driver fitness.

1. Introduction

Dementia is defined as a major neurocognitive disorder or syndrome that impacts one or more cognitive domains (e.g., memory, orientation), and thereby interferes with independent and self-care activities of daily living (American Psychiatric Association, 2013). Estimates on the prevalence of dementia suggest that almost 14% of adults over age 70 years may be affected today (Plassman et al., 2007). The most common form of dementia is from Alzheimer's disease (AD), a progressive, neurodegenerative brain disorder which is estimated to afflict 5.2 million persons in the U.S. today (McKhann et al., 2011).

Despite a growing understanding of the disease, many primary care physicians lack expertise in diagnosing AD and may assign a diagnosis of dementia, Not Otherwise Specified (NOS) until the symptom pattern clarifies or specialist confirmation is obtained (Iliffe et al., 2009). Whether the diagnosis is AD or dementia, NOS, the majority of affected individuals (~80%) are over the age of 75 years, and their total numbers are expected to more than double by 2050 (Hebert et al., 2013).

In addition to growing numbers, another challenge is the substantial (up to 50%) under-diagnosis of dementia in primary care medicine today (Connolly et al., 2011). Undiagnosed individuals are also untreated and must manage on their own. Dementia (diagnosed or not) impacts the family significantly, as those close to the afflicted individual must cope with increasing demands and burdens of providing care, supervision and support (Connell et al., 2001).

These facts are relevant to roadway safety today in that, as a group, drivers aged 70 and older demonstrate higher crash rates in comparison to middle-aged counterparts, and they are also more fragile and so more likely to sustain serious injury or death when in a crash (Li et al., 2003; Ulfarsson and Mannering, 2004; Kim et al., 2013). Dementia is an accepted risk factor for older driver fitness concerns, especially as functional declines become apparent in daily living (Carr and Ott, 2010). When dementia is present, driver safety is influenced both by the stage of disease and pattern of functional loss. A number of studies have shown that drivers with

* Corresponding author. Tel.: +354 525 4907; fax: +354 525 4632.
E-mail addresses: meusert@umsl.edu (T.M. Meuser), dcarr@wustl.edu (D.B. Carr), eau1@hi.is (E.A. Unger), gfu@hi.is (G.F. Ulfarsson).
[1] Tel.: +1 314 516 5421.
[2] Tel.: +1 314 286 2700.

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early, very mild dementia demonstrate similar safety behaviors to their non-demented age counterparts, and so are often able to continue driving successfully for a time (Eby et al., 2012; Hunt et al., 1993). Risk increases with disease progression, however, such that those with mild and more advanced dementia show increased way-finding difficulties (Uc et al., 2004; Beatty and Bernstein, 1989) and crash risk relative to age-matched controls (Dubinsky et al., 2000; Drachman and Swearer, 1993).

Family input is important across the spectrum of dementia care. Family members are in, perhaps, the best position to observe progressive changes in cognition and function in persons with dementia, including deficient driving skills (Perkinson et al., 2005). As passengers, they can readily see changes in driving skills (e.g., execution of left turns, decisions about lane position), as well as aftermath of past problems (e.g., dings and dents to the car). Family (informant) input concerning dementia detection and diagnosis is highly valued in geriatric medicine today (Galvin and Sadowsky, 2012). Family input is also valued with respect to supporting self-regulation of the demented driver, discussion of driving cessation when necessary, and alternative transportation planning (D'Ambrosio et al., 2007). Driver licensing authorities rely on family members, when necessary, to notify them of at-risk drivers with dementia who may refuse to stop driving and so pose a hazard to others (Meuser, 2008).

While trends indicate that today's older adults are driving more miles annually than previous cohorts,[1] it is unclear how well this pattern applies to older drivers with dementia. Some studies suggest that drivers with dementia travel fewer miles in comparison to cognitively intact controls (Trobe et al., 1996; Dubinsky et al., 1992). Regardless of distance and exposure levels, numerous studies have demonstrated that drivers with dementia have at least a 2–8 fold greater risk of crash involvement in comparison to age-matched controls (see review in Carr and Ott, 2010).

It is also unknown how many active older drivers may have an underlying dementing condition, since few studies have addressed this issue directly. A study which combined epidemiological and clinical data estimated that 4% of current drivers over 75 years have cognitive impairment consistent with dementia (Foley et al., 2000). Research involving cognitive screening during driver license renewal found that 20% of drivers aged 80+ years failed the screen, suggesting the possibility of an underlying dementia (Stutts et al., 1998). Older drivers are known to self-regulate and make decisions to limit exposure to weather and road conditions that may place them at greater risk, and this is true for drivers with dementia who retain sufficient awareness of deficit (Cotrell and Wild, 1999; Ball et al., 1998). Self-awareness of deficit in dementia diminishes with disease progression, and so drivers with more advanced dementia may be more likely to make imprudent driving decisions (e.g., driving at night in the snow) and so constitute an important subgroup for identification and evaluation (see discussion in Meuser et al., 2006).

Departments of Motor Vehicles (DMVs) and other driver licensing authorities have a vested interest in ensuring that licensed drivers meet basic fitness criteria (see discussion in Meuser, 2008). Passing tests of visual acuity and field width, knowledge of traffic regulations, and demonstrated on-road performance, constitute the core requirements for licensure in many jurisdictions. These same requirements often apply to drivers cited as unfit due to dementia-related cognitive decline and other medical-functional conditions (Meuser, 2008).

Most US states employ voluntary reporting mechanisms for the types of medical-functional conditions that impact older drivers (Berger et al., 2000). In Missouri, for example, the voluntary reporting law (House Bill 1536) allows certain stakeholders – including law enforcement, physician and other health professionals, social service professionals, and family members – to report a driver as unfit to the Driver License Bureau, Missouri Department of Revenue. Reports made in good faith initiate an evaluation process which starts with submission of a physician evaluation (Form 1528) and often culminates in on-road testing through the Driver Examination Division, Missouri State Highway Patrol. The total process usually requires 60–90 days, during which time the reported individual may continue to drive legally. Physician recommendations are followed closely by driver licensing officials when making the final licensing determination, and so physician documentation of dementia and its potential impact on driver fitness are important inputs to the licensing system across jurisdictions.

Input from family members provides further context for licensing officials by shedding light on how medical conditions and on-road incidents relate to broader functional challenges faced by at-risk older drivers (Meuser, 2008). Few studies, to date, have examined cases of drivers with cognitive concerns involving input from both family members and physicians. How data from these two sources are utilized by driver licensing officials is important to understand.

This study was undertaken to better understand the observations and concerns of family members. Four questions were addressed: (1) what cognitive symptoms and driving behaviors did family members list on reporting forms? (2) How many reported drivers saw a physician and submitted the required medical evaluation form? (3) Among those who submitted the medical form, to what extent did physicians and family members agree on cognitive concerns? (4) What were the licensing outcomes of drivers with identified cognitive concerns?

Based on a prior examination of data involving both drivers with and without cognitive concerns (see Meuser, 2008; Meuser et al., 2009), it was hypothesized that family members would identify more drivers with cognitive impairment than would physicians. It was also anticipated that fewer family reported drivers with a cognitive concern (in comparison to those without) would go on to complete on-road testing if required by driver licensing officials. Based on prior examination of these data, it was expected that very few (cognitively impaired or not) would complete the full process and retain a valid license to drive.

2. Data and methods

Missouri's Reporting Law (HB-1536), passed in 1998, created a voluntary process whereby concerned stakeholders (i.e., family members, police officers, physicians, license office staff, others) may report an individual for a fitness-to-drive evaluation and possible license revocation. Civil immunity and confidentiality protections apply to reporters and the physician evaluator. The law does not discriminate with respect to age. Meuser (2008) investigated a sample of 4100 drivers reported as unfit to drive in Missouri in the years 2001–2005. Drivers in this sample were reported by police officers (30%), license office staff (27%), physicians (20%), and family members (16%). A recommendation from this effort was to increase education and otherwise encourage increased reporting from family members.

The current investigation was, at first, restricted to those initially reported by family members ($n = 631$). There were a number of instances where family reports were made following another report

[1] Insurance Institute for Highway Safety, 2014. Unpublished analysis of data from the 2008. National Household Travel Survey and 1995 Nationwide Personal Transportation Survey. Arlington, VA. Accessed on June 15th, 2014 at: http://www.iihs.org/iihs/topics/t/older-drivers/qanda.