Margaret F. Brinig, J.D., Ph.D., Mark E. Wilkinson, O.D., Jeanette M. Daly, R.N., Ph.D., Gerald J. Jogerst, M.D., and Edwin M. Stone, M.D., Ph.D.

# Vision standards for licensing and driving

Driving is important to an adult's sense of well-being. When a person loses the privilege to drive, a variety of ills may follow. These effects of loss of driving privileges have been noted not only for Americans[1] but also for people in Germany[2] and Britain.[3]

In much of the United States, driving is typically an important factor in continued independence and connection with others. Once independence is lost, the older person (especially in rural or suburban America) may be unable to live alone and may have to move into an assisted-living environment; rely on the ministrations of children, relatives, or friends; or even relocate to another area. Maintaining one's independence is strongly connected with physical and mental well-being.[4] For an increasingly aging population, therefore, continuing to drive has enormous and growing significance, especially for those living outside urban areas and without easy public transportation.

Older persons frequently self-monitor and restrict their driving because they realize they cannot see as well as they had in the past or they have slower reaction times.[5] In addition to decreasing the number of miles they drive, they may make other changes in their driving habits such as driving only during the daytime, driving the side streets instead of main streets, driving more slowly, or only driving on Sunday.[6] Still, the number of older persons is increasing, escalating the number of older drivers and also, so far, their accident rates.[7] Regardless of age, for both their own physical and mental health and for the safety of others on the road, society has an interest in keeping unsafe drivers from driving.

The driving privileges of the older person are, and will continue to be, an issue of public debate, especially after such high profile cases as the accident of the 80-year-old driver in California who killed 9 people at a farmer's market.[8,9] As the older population increases, a quarter of all fatal crashes are expected to come from the 28 million drivers age 65 years and older.[10] "Achieving a balance between public safety and older adults' own safety and independence [mandates] safety initiatives directed specifically at older adults. Imposing blanket restrictions on older drivers would not serve the goal of maximizing the independence of older adults while ensuring public safety and their own."[11]

Although older drivers are at a higher risk for fatal accidents, unsafe driving does not tell the whole story. As they age, people also become more frail, so a higher percentage of accidents in which injuries occur will result in deaths of older persons.[12] Some accidents that would not cause any injury to a youthful driver may prove fatal to an older person.

This report uses 2003 data, available from the U.S. Department of Transportation, concerning all accidents reported to state agencies. The data included the driver's age and ZIP code. These data were matched to each state so that they could be associated with the state's driving laws and demographic data. The purpose of this report is to describe and classify each state's driver's licensing laws; determine the percentage of persons older than 64 with licenses; and, of those licensed who had accidents, to investigate whether there is a relationship between the licensing laws and the accident rates and to recommend a uniform driving standard. This differs from the work of other investigators because it does not rely on the legal data collected by others (such as in Ball et al.[13] and Grabowski et al.[14]); we categorize the state licensing laws differently and in more detail.

Margaret F. Brinig, J.D., Ph.D.

Mark E. Wilkinson, O.D.

## Methods

The regulation of drivers generally takes place at the state level. Most

1529-1839/07/$ -see front matter 
doi:10.1016/j.optm.2007.06.012

states have specific, detailed qualifications for original and renewal licensing in regulations promulgated by the department of motor vehicles, with or without the help of a medical control board. Each state's statutes and regulations typically are compiled in a driver's license manual. States prescribe different licensing standards, renewals, and physician reporting procedures. Some of these variations include the renewal interval, vision requirements, options for discretionary or restricted licensing, and type of road testing. Some, but not all, states require that drivers have a specified minimum required field of vision, the most frequent being 100° or greater with both eyes.[15]

Even the restrictions vary. West Virginia and Vermont, for example, do not provide for driving with any restrictions beyond those for corrective lenses. Most states allow for driving with restrictions, but they differ widely and can include daylight-only driving, no highway driving, driving for business or employment only, driving only with power steering, or driving using special controls or equipment. For example, Wyoming provides for driving with specific restrictions that include daytime driving only and weather and distance restrictions, whereas Nebraska has a table specifying various restrictions given varying vision problems. Restricted licensing does not solve all the problems, either. Marshall et al.[16] found that drivers with restricted licenses have a higher crash rate than those without restrictions.

Although according to federal law (49 C.F.R. § 391.27 [2005]), commercial driver's license holders must report arrests for moving violations to the state, there is no such standard requirement that the noncommercial drivers self-report either arrests or an inability to drive safely between renewals. That said, some states do suggest that such problems be reported, and many provide immunity from civil or criminal liability for those reporting.

Some states change the renewal procedures for older persons by shortening the period between renewals, by mandating in-person as opposed to mail-in registration, or by requiring vision, written, or road testing. One might expect these increased screens to produce fewer problem drivers. In fact, Levy[17] examined the relationship between driver's license renewal policies and fatal crashes and found that state-mandated tests of visual acuity adjusted for license renewal periods were associated with lower fatal crash risk for senior drivers.

This article expands on the earlier work of these investigators by including all licensing requirements and a different outcome variable of reported traffic accidents. Their work was based on drivers age 70 years and older because many state renewal policies applicable to older drivers were triggered at age 70. More recently, many states have changed their renewal provisions. Currently, 12 states have criteria for persons 65 years and older, 2 at 60 or older, 1 state at 61 years or older, 1 at 63 or older, 1 at 69 or older, and 4 states for persons 70 years and older. Twenty states have no specific age-based renewal procedures. With a standard renewal requirement of 4 to 6 years for most states, the older person 65 to 70 will have to renew at some point. Frequent renewal may have an impact on the number of fatalities and crashes. For a chart summarizing these rules, see the Web site for Insurance Institute for Highway Safety, Licensing Renewal, Older Drivers (*http://www.iihs.org/safety_facts/state_laws/older_drivers.htm*).

## Results

Given all these differences, it is perhaps not surprising that the results on rates of driving and accidents by those older than 64 vary widely as well. The percentage of the driving population that is older than 64 varies from a low of 7.5% (Alaska) to a high of 19.6% (Florida), whereas the overall average is 14.9% (*see* Table 1). What is more revealing is the ratio of the number of older persons driving compared with their number in the population after eliminating the effect of large versus small states. The District of Columbia (23.5%) and Rhode Island (32.5%) had the lowest numbers of older drivers, whereas Alaska (50.4%), Connecticut (50.1%), and Vermont (49.6%) had the highest, all with about 50% of the older population driving, with an average of 39.5% among all jurisdictions.

The accident data utilized in this study come from the National Highway Traffic Safety Administration (NHTSA).[18] Because there are so many more accidents than fatalities, the NHTSA selects a representative national sample of accidents for its publicly available data, and these data are used for this report.

From the NHTSA accident data, taking the number of accidents with drivers older than 65 and dividing it by the number of drivers older than 65 produces substantial variance from state to state. The accident data calculation for 2003 shows variability from a low of no reported accidents by older persons in Hawaii, the District of Columbia, North Dakota, and Vermont (and only 1 in Utah and approximately 2.5% in California), to 11.6% in Colorado, 11.7% in New Mexico, 14.3% in Michigan, 17.7% in Alabama and 18.8% in Arizona (*see* Table 1).

## Regulatory options for improving driving of older persons

When deciding on licensing and driving standards, states could, and do, select among a variety of regulatory options. The lawmakers are presumably balancing access to driving privileges, convenience and cost of licensing, and ensuring continued driving safety. We list some of these methods and the states that have chosen them in Table 2 and the rate of accidents produced in Table 1. In review-

**Table 1** Frequency of over-64 driving and accidents

| State | Over-64 drivers/all drivers | Over-64 drivers/over-64 population | Over-64 in accidents/over-64 licensed drivers |
|---|---|---|---|
| AK | 7.5% | 50.4% | 2.2% |
| AL | 16.3% | 48.9% | 17.7% |
| AR | 17.4% | 42.6% | 0.2% |
| AZ | 15.2% | 39.1% | 18.8% |
| CA | 11.9% | 35.6% | 2.5% |
| CO | 11.4% | 44.6% | 11.6% |
| CT | 18.5% | 50.1% | 0.3% |
| DC | 10.1% | 23.5% | 0.0% |
| DE | 15.9% | 41.1% | 2.2% |
| FL | 19.6% | 43.1% | 5.7% |
| GA | 11.5% | 38.5% | 0.2% |
| HI | 14.2% | 35.2% | 0.0% |
| IA | 17.0% | 35.3% | 7.6% |
| ID | 15.4% | 43.5% | 1.0% |
| IL | 14.0% | 34.2% | 4.9% |
| IN | 12.8% | 33.9% | 4.9% |
| KS | 15.7% | 38.1% | 0.6% |
| KY | 15.0% | 39.2% | 1.7% |
| LA | 14.8% | 35.4% | 0.3% |
| MA | 14.8% | 38.3% | 3.8% |
| MD | 13.9% | 37.1% | 5.8% |
| ME | 15.6% | 38.2% | 0.3% |
| MI | 14.4% | 38.6% | 14.3% |
| MN | 16.4% | 38.9% | 0.3% |
| MO | 15.6% | 36.7% | 5.5% |
| MS | 15.0% | 36.7% | 2.2% |
| MT | 15.7% | 42.0% | 0.4% |
| NC | 13.2% | 38.5% | 7.5% |
| ND | 17.2% | 38.8% | 0.0% |
| NE | 15.9% | 39.8% | 7.4% |
| NH | 13.5% | 40.9% | 0.3% |
| NJ | 16.3% | 39.9% | 5.4% |
| NM | 14.8% | 40.1% | 11.7% |
| NV | 13.9% | 44.7% | 0.3% |
| NY | 15.2% | 34.5% | 6.2% |
| OH | 16.0% | 38.1% | 5.2% |
| OK | 17.7% | 35.7% | 5.8% |
| OR | 15.0% | 41.7% | 0.6% |
| PA | 17.5% | 36.0% | 3.8% |
| RI | 16.6% | 32.5% | 0.4% |
| SC | 14.9% | 40.2% | 0.3% |
| SD | 17.4% | 40.3% | 0.7% |
| TN | 15.4% | 42.6% | 9.4% |
| TX | 12.6% | 36.1% | 7.0% |
| UT | 11.6% | 41.9% | 0.05% |
| VA | 12.9% | 37.5% | 8.9% |
| VT | 15.5% | 49.6% | 0.0% |
| WA | 13.1% | 40.1% | 5.0% |
| WI | 15.0% | 36.8% | 5.5% |
| WV | 18.0% | 39.7% | 0.4% |
| WY | 15.7% | 48.6% | 1.1% |
| Average | 14.9% | 39.5% | 4.1% |

Data from Department of U.S. Department of Transportation, Federal Highway Administration, for 2000, Highway Statistics 2000, Table DL-22; United States Census.

ing Table 2, the reader should be aware that in some states, there was only 1 obvious predominating method of licensure. However, a number of states incorporate several different methods into their licensing standards, making this analysis more complicated. To arrive at a final categorization for each state, one of the authors,

**Table 2** Prevalent type of regulation

| State | Type of regulation |
|---|---|
| AK | Reporting |
| AL | Private |
| AR | Unregulated |
| AZ | Private |
| CA | Individualized |
| CO | Private |
| CT | Individualized |
| DC | Frequent-road |
| DE | Restricted |
| FL | Frequent-road |
| GA | Individualized |
| HI | Restricted |
| IA | Frequent-road |
| ID | Frequent-road |
| IL | Frequent-road |
| IN | Frequent |
| KS | Individualized |
| KY | Individualized |
| LA | Frequent |
| MA | Individualized |
| MD | Restricted |
| ME | Reporting |
| MI | Private |
| MN | Individualized |
| MO | Frequent |
| MS | Individualized |
| MT | Frequent-in person |
| NC | Unregulated |
| ND | Individualized |
| NE | Individualized |
| NH | Frequent-road |
| NJ | Reporting |
| NM | Frequent-vision |
| NV | Restricted |
| NY | Restricted |
| OH | Private |
| OK | Individualized |
| OR | Individualized |
| PA | Individualized |
| RI | Individualized |
| SC | Frequent |
| SD | Individualized |
| TN | Unregulated |
| TX | Individualized |
| UT | Frequent-vision |
| VA | Frequent-vision |
| VT | Individualized |
| WA | Frequent-in person |
| WI | Individualized |
| WV | Individualized |
| WY | Frequent-vision |

Note. There were 100,216 drivers for whom ZIP code of residence was available.

Data on accidents from the National Highway Traffic Safety Commission, *ftp://ftp.nhtsa.dot.gov/ges/* (2003 data).

an attorney, chose the predominating method after reviewing the statutes or regulations for each state.

An example of a state in which the analysis required a subjective determination was Pennsylvania. When the regulations for Pennsylvania were first reviewed, mandatory reporting appeared to be the dominant standard. However, after the regulations were further reviewed, the author decided that individualized was a better fit because of the options available in Pennsylvania for individual review and restricted licensing. This subjective assessment was then checked against each state statute by law students to be sure the categorization was supported. Finally, the law review staff at Notre Dame University checked each state's statutes for accuracy with Table 2.

## Restricted

States might restrict all driving by older persons because they are more accident and certainly more fatality-prone ("Restricted" in Table 2). This choice of course may have consequences under discrimination laws, and some states have been sued by older persons on these grounds.[19] In our opinion, the easiest and most cost-effective way to limit driving in a non-discriminatory fashion is to restrict driving through vision requirements of 20/40 acuity or better and a minimum 140 degree field of vision for licensing. The restricted approach is cost effective by eliminating the administrative costs associated with individualized review. This is apparently the rule in states such as Hawaii, Nevada, and New York (*see* Table 2). The idea that this is less expensive is perhaps more illusory than real, for, as noted above, the inability to drive may lead to more depression, more isolation, and perhaps even more elder abuse as older persons must live with relatives or in nursing homes for longer and longer periods.[20] The gain is that presumably older persons are not causing accidents but at a cost of additional burdens on families and facilities.

Levy[17] found that more frequent license renewal also cut down on the number of older drivers. Hawaii, which permits no discretionary licensing, also begins a 2-year renewal cycle for drivers older than 72 and personal appearances for all those over 65. Because of concerns about discrimination suits,[19] New York adheres to its 5-year renewal cycle even for older drivers and has an accident rate (6.2%) greater than the average of 4.1%. This higher accident rate may be caused by the development of driving problems during the lengthy period between licensing episodes. One way to resolve the problem of unsafe drivers with longer licensing renewal periods is mandatory reporting. The Safe Mobility for Older People Notebook recommends mandatory reporting by physicians if the individual will not. (*See* the following Web site: *www.nhtsa.dot.gov/people/injury/olddrive/modeldriver/3_foreword.htm*).

## Unregulated

The other extreme is that the state can allow all people, regardless of characteristics, to drive, revoking the license only when the driver is involved in, for instance, a fatal accident ("Unregulated" in Table 2). Tennessee (in which drivers are presumably licensed forever once they reach age 70) seems to do this. Tennessee also suffers from the sixth highest accident rate (9.4%) (behind Colorado [11.6%], New Mexico [11.7%], Michigan [14.3%], Alabama [17.7%] and Arizona [18.8%]) of over-64 drivers/driving population. Like the first option, lack of regulation provides low-cost administration, placing the burden on the families of unsafe drivers to take away their keys and seemingly allowing many unsafe drivers to stay on the roads.

## Reporting

A third option, followed by Arkansas, Maine, and New Jersey, involves mandatory physician reporting for vision ("Reporting" in Table 2). Maine has a very low number of accidents per older driver (0.3%), whereas Arkansas is still well below the norm at 2.2%. Reporting places the burden on physicians (or on the individual if they avoid doctors who might report them). The state incurs the cost of retesting those referred. These states also have discretionary licensing including individualized restrictions that may be required by the Medical Advisory Board. To make physician reporting successful, these states also need to provide immunity for those who report, even if it turns out they were mistaken. Mandatory reporting takes the burden of making the no-driving decision off the elder's family. It also has the perceived benefit of catching problem drivers (assuming there is a statistical relationship between aspects of vision and driving) rather than waiting for license renewals. This type of procedure is lauded by the new guidelines of the American Academy of Family Physicians.[21]

## Individualized

States may rely on flexibility in licensing ("Individualized" in Table 2). In some states, this requires the doctor, perhaps with guidelines, to specify restrictions. In others, the restrictions are placed by the Medical Advisory Board or a similar group. Again, the persons specifying restrictions must have immunity. Many of the costs lie in drafting regulations (guidelines are already available in Nebraska and Pennsylvania as well as on the National Committee for Uniform Traffic Laws' Web site *http://www.ncutlo.org*), and keeping track of restricted drivers through new technology may make this easier. Unlike the reporting option, individualized licensing does not identify drivers between renewals. For several years, New York has proposed allowing physicians, police officers, or family members to report unsafe drivers (again, with immunity unless the reporting is malicious). Were this bill to pass, it would be similar to the rule in effect in North Dakota (N.D. Cent. Code § 39-06-34).

## Frequent-road/vision/in person

Another popular option is administratively expensive and is characterized by frequent driving tests or other face-to-face appearances for older persons ("Frequent-road test," "Frequent-vision," or "Frequent-in person" in Table 2). People older than 64 might complain that they have been discriminated against in such states, and frequent appearances and testing are burdensome and costly for those who are indigent or who live in rural areas. The 3 states currently using the road test on reissuing senior's licenses include the District of Columbia, where road tests begin when the driver is 75 along with physician's certification of driving ability, vision, and sometimes competency tests; Illinois conducts tests every 4 years beginning when the driver is 75, every 2 years from 81 to 86 and every year thereafter; and New Hampshire tests every 5 years beginning when the driver is 75.

More states require vision testing at renewal, including Florida (age 80 or older, every 4 to 6 years), Maine (every 4 years after 65), Maryland (every 4 years beginning at 40), Oregon (every 8 years after age 50), South Carolina (every 5 years beginning at 65), Utah (every 5 years beginning at 65), and Virginia (since 2004, every 5 years beginning at 80). The 4 smaller states (Maine [0.3%], Oregon [0.6%], South Carolina [0.3%] and Utah [0.05%]) all have lower-than-average accident rates for elders, whereas Florida (5.7%), Maryland (5.8%), and Virginia (8.9%) still rank in the bottom third. Another group of states requires licensing in person. States with rules prohibiting discrimination based on age, according to the Insurance Institute Web site (*http://www.iihs.org/*), include Maryland, whose law specifies that age alone is not grounds for reexamination of licensees. However, applicants for an initial Maryland license at age 70 and older must provide proof of previous satisfactory operation of a vehicle or physician's certificate of fitness. Massachusetts law, which prohibits discrimination by reason of age with regard to licensing, ranks in the highest half of accidents per drivers older than 65. Minnesota and Nevada law specify that age alone is not a justification for reexamination, but in Nevada, applicants for mail renewal at age 70 and older must include a medical report. Both of these states are in the lowest fifth of accidents per driver older than 64, and both provide for flexible and restricted licensing of people unable to meet the usual vision standards (so that their pattern meets the individualized grouping).

## Private

A more private solution, and one supported by the American Association of Retired Persons (AARP),[22] is to require insurance companies to give discounts for seniors taking refresher courses ("Private" in Table 2). Sixteen states follow this procedure, although only 6 of these seem to use it as their primary strategies. All these states rank near the highest in accident rates, including 4 of the highest 5 (Alabama [17.7%], Arizona [18.8%], Colorado [11.6%] and Michigan [14.3%]). New Mexico (11.7%) is the other state in the top 5, despite having frequent vision testing requirements for maintaining licensure.

## Self-reporting

Although no states currently do this, an option would be to regulate through self-reporting as with moving violations for commercially licensed drivers, under 49 C.F.R. § 391.27 (2005). The anticipated problem is lack of compliance with the federal regulations and enforcement by state authorities. This lack-of-compliance problem might be similar to the mandatory physician's reporting problems reported in the regulation comments in Pennsylvania (PA Admin. Code Sec. 57.83.3).

Should states have a vision standard for *driving* as opposed to one for licensure? If there were a vision standard for driving, and each state made its citizens aware that they were responsible for knowing if they met the vision standard for driving, there would be small need for mandatory doctor reporting. The eye doctor would note in the patient's chart whether the individual met the vision standard for driving (documenting the fact) and would inform the patient. The individual wanting to drive would then be responsible for reporting to the Department of Motor Vehicles for further assessment, if below the standard. If the individual did not make such a report (for example, not being competent), the physician may choose to report the individual in an effort to protect both the individual and the public. Vermont, as an example, asks drivers seeking renewal the following question: "Have you any physical or mental condition, other than properly corrected eyesight, that could affect your ability to safely operate a motor vehicle? If "Yes," provide (or send) details." If the details are not satisfactory to the Vermont motor vehicle department, reported drivers may be required to take a medical evaluation form to their physician for completion. Self-reporting similarly relies on individualized treatment of drivers rather than blanket rules. Potential problems with this approach include a lack of driver honesty and cognitive impairment.

## Need for model licensing

We strongly support the movement toward uniform driver's licensing. The only state statute that currently supports uniformity is North Carolina (Uniform Driver's Licensing Act, Chapter 20, Article 2, Section 20-5), although this was somewhat of a national movement in the 1950s and 1960s. The Uniform Vehicle Code, promulgated through the Institute for Highway Safety, renewed the effort toward a uniform regulation in 2000. Congress is currently working toward federal control and standardization of licensing for Homeland Security purposes, but there could be another purpose as well: making sure that the most successful regulations can be adopted and thus help older persons who live in our mobile society to remain independent. From our cataloging of the current licensing schemes, it seems that

some mix of individualized licensing and frequent contacts with the Department of Motor Vehicles is most successful at reducing accidents. Self-reporting of driving problems (if done) *between licensing periods* should be at least as effective as mandated physician reporting and would draw in the population of those who are increasingly dangerous on the road. The "private" solution of reducing insurance rates based on taking a refresher driver's course allows more driving, but significantly increases the accident rate for over-64 drivers by nearly 8%.[23]

## Discussion

Safety research illustrates that age alone is a poor predictor of driving safety or ability. Ball et al.[13] stated "there are no cut-off criteria in acuity, contrast sensitivity, or peripheral vision that could be adopted . . . which would not include a significant number of crash-free drivers as well."

With this in mind, it is reasonable to conclude that driving safety does not depend so much on what is seen, but rather on how quickly and adequately drivers respond. Based on current information, we might conclude that individuals should not be automatically penalized from driving based only on decreased visual function, central vision, or visual field. The issuance of a driver's license should not be an all or none decision. Restricted licenses are needed to allow for continued driving, while assuring a greater safety margin by avoidance of those situations that could prove hazardous.

Based on the information presented in this article, the authors agree with Wilkinson's suggestion in 2003[24] that it is time to develop a uniform, nationwide, rational approach to the assessment of drivers. "Unfortunately, there is no evidence-based research to support or refute a given set of standards. However, to do nothing will perpetuate the potentially inappropriate penalizing of individuals with visual impairments who wish to acquire or maintain driving privileges."[24] In other cases, doing nothing will mean that too many unsafe drivers remain on the road, particularly those whose vision deteriorates between renewals or those who lose physical or mental capacity but who may maintain adequate eyesight.

The Department of Transportation of Iowa expanded the standards for driver's licensure a number of years ago. The authors have found the Iowa approach to driving with a visual impairment to be a very workable solution to address the assessment of driving competency. By allowing individuals with visual impairments to demonstrate their ability to safely operate a motor vehicle and acquire/maintain their driving privileges, Iowa now has a cohort of individuals who can be statistically monitored to assess their driving safely. In other words, at least some of the hypotheses of this article can be tested in this state. We therefore recommend adoption of the following criteria, currently used by the Iowa Department of Transportation, concerning visual functioning and driving (excerpted from the Wilkinson editorial[24]):

1. An unrestricted, non-commercial drivers' license can be issued to anyone with a visual acuity of 20/40 or better in 1 or both eyes, with an uninterrupted (excluding the physiologic blind spot) visual field of 140° horizontally (measured with a V4e isopter or its equivalent) in 1 or both eyes and no other conditions which may impair driving ability.
2. A restricted non-commercial drivers' license that allows for driving when headlights are not required can be issued to anyone with a visual acuity of <20/40 to 20/70 in 1 or both eyes, with visual fields as in section 1 and no other conditions that may impair driving ability.
3. Individuals who should be judged on an individual basis include: a) those with visual acuity of <20/40 to 20/70 who wish to drive when headlights are required, b) those with visual acuities less than 20/70 but better than 20/200 who wish to acquire driving privileges or continue driving, perhaps with other restrictions, c) those with an uninterrupted (excluding the physiologic blind spot) visual field, measured horizontally, less than 140° but greater than 20°, and d) those with an interrupted visual field, measured horizontally, greater than 20°.

For any of the individuals noted in 3, a report of a recent eye examination should be submitted to the Department of Motor Vehicles at the time of licensing. This report should include at a minimum best-corrected visual acuity, need for glasses or contact lenses, extent of horizontal visual field, presence of blind spots (excluding the physiologic blind spot), and diagnosis and prognosis of the eye condition. These individuals should have no other conditions that alone or in combination with the visual deficit may impair driving ability.

The authors acknowledge there are additional factors to take under consideration for driving and licensing. Licensing for individuals judged on an individual basis must be based on being judged a safe driver during an on-the-road evaluation by a qualified driving instructor or driving evaluator. This holds true for individuals with best-corrected visual acuity of 20/200 or worse in the better eye or a visual field of 20° horizontally or less. The authors recommend that individuals in this category should not drive a motor vehicle except as determined on a case-by-case basis and then on appeal to the licensing authority. Additionally, the authors would recommend that bioptic telescopes not be used to meet static visual acuity requirements for licensing nor be required for licensing but may be used for driving, after training in their use for driving and

demonstrated ability to use them safely and efficiently.

The final licensing responsibility should rest with the Department of Motor Vehicles and be based on an evaluation of actual driving performance. Visual acuity and visual field standards should be for qualifying for driving, not for licensure, placing responsibility on individual drivers to know whether they meet the visual criteria to continue operating a motor vehicle between license renewal periods.

Eye care professionals should be the only people to make the decision concerning whether a person meets the legal visual requirements to qualify to drive. Until evidence-based visual data suggest otherwise, only after an individual with a visual acuity or visual field limitation is determined to be visually qualified, should a behind-the-wheel test to acquire or maintain driving privileges be given.

***Editor's note*:** An additional reference related to this topic is the AOA Motorist Vision Policy: Shipp MD, Daum KM, Weaver JL, et al. Motorist vision policy. *Optometry* 2000;71:449-53. Copies are available on the AOA Web site at *http://www.aoa.org/documents/MotoristVisionPolicy.pdf*, or by contacting the AOA Clinical Care Group at *JLWeaver@aoa.org*.

## References


1. Ragland DR, Satariono WA, McLeod KE. Driving cessation and increased depressive symptoms. *J Gerontol A Biol Sci Med Sci* 2005;60(3):399-403.
2. Schlag B. Elderly drivers in Germany fitness and driving behaviour. *Accid Anal Prev* 1993;25:47-55.
3. U.K. Department for Transport. Research Report No. 25 (November) Older drivers: A literature review, 2001. Available at: *http://www.dft.gov.uk/stellent/groups/dft_rdsafety/documents/pdf/dft_rdsafety_pdf_504602.pdf*. Last accessed July 5, 2005.
4. Ried LD, Planas LG. Aging, health and depressive symptoms: Men and women. *J Women's Health* 2002;11(9):813-24.
5. Evans L. How safe were today's older drivers when they were younger? *Am J Epidemiol* 1993;137(7):769-75.
6. Miller WJ. Older drivers—a complex public health issue. *Health Reports* 1999;11(2): 59-71.
7. Buechner JS. Motor vehicle crashes among the elderly, 1994-1998. *Med Health* 1999; 82(12),449-50.
8. McGregor D. Driving over 65: Proceed with caution. *J Gerontol Nurs* 2002;28(8):22-6.
9. McLaughlin A, Paulson A. Age and driving: a closer look. The Christian Science Monitor, 2003. Available at: *http://www.csmonitor.conV2003/0718/pOls03-usgn.html*. Last accessed August 13, 2003.
10. Centers for Disease Control and Prevention, National Center for Health Statistics. (n.d.). *NCHS Data on Alzheimer's Disease*. Available at: *www.cdc.gov/mchs/data/factsheets/Alxheimers.pdf*. Last accessed August 24, 2005.
11. Bedard M, Stones MJ, Guyatt GH, et al. Traffic-related fatalities among older drivers and passengers: Past and future trends. *Gerontologist* 2001;41(6):751-6.
12. Foley DJ, Heimovitz HK, Guralnik JM, et al. Driving life expectancy of persons aged 70 years and older in the United States. *Am J Public Health* 2002;92(8):1284-9.
13. Ball K, Owsley C, Sloane ME, et al. Visual attention problems as a predictor of vehicle crashes in older drivers. *Invest Ophthalmol Vis Sci* 1993;34(11):3110-23.
14. Grabowski DC, Campbell CM, Morrisey MA, et al. Elderly Licensure Laws and Motor Vehicle Fatalities. *JAMA* 2004;291(23): 2840-6.
15. Peli E, Peli D, eds. *Driving with confidence, a practical guide to driving with low vision.* Singapore; World Scientific; 2002.
16. Marshall SC, Spasoff R, Nair F, et al. Restricted driver licensing for medical impairments: Does it work? *Can Med Assoc J* 2002;167(7):747-51.
17. Levy D. The effect of age and state license renewal policies upon licensure rates. *Accid Anal Prevent* 1995;27:461-7.
18. U.S. Department of Transportation National Highway Traffic Safety Administration. Available at: *ftp://ftp.nhtsa.dot.gov/ges/* (2003 data). Last accessed August 15, 2005.
19. Berger v. Melton, 418 N.Y.S. 2d 880 (N.Y. Sup. Ct. 1979).
20. Brinig MF, Jogerst GJ, Daly JM, et al. The public choice of elder abuse law. *J Legal Studies* 2004;33:517.
21. Marottoli RA. The physician's role in the assessment of older drivers. *Am Fam Physician* 2000;61(1):39.
22. American Association of Retired Persons. Policy positions, 2005. Available at: *http://www.aarp.org/research/*. Last accessed August 8, 2005.
23. Brinig MF. The public choice of driving competence regulations. *Notre Dame Journal of Law and Public Policy* 2007;Spring.
24. Wilkinson ME. Driving with a visual impairment: new guidelines are needed. *Optometry* 2003;71(1):7-10.


## Corresponding author:


Mark E. Wilkinson, O.D.
University of Iowa Carver College of Medicine
Vision Rehabilitation Service
Department of Ophthalmology and Visual Sciences
200 Hawkins Drive, Iowa City, Iowa 52242

mark-wilkinson@uiowa.edu