

Lessons learned through the development and implementation of an evaluation for medically at risk drivers

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The aging of the population is transforming the demographics of the driving population in most industrialized countries of the world. In North America, one in every four drivers will be over the age of 65 within two decades. Not only are there more seniors driving than ever before, but they also are driving more and longer into old age (Stutts et al., 1989; Eno Transportation Foundation, 2000) where crash-risk is highest.

The increased driving and dependence of seniors on the private vehicle has brought with it serious consequences: There have been dramatic increases in the number of crashes, injuries, and fatalities of seniors. For example, when the amount of driving is taken into account, drivers age 75+ now have the highest crash rates of all other age groups, except those 16-24 years of age (Evans, 1988; Carr et al., 1990; Transportation Research Board, 1988). Between 1979 and 1995, injuries and fatalities to seniors increased by a staggering 47.2% (Transport Canada, 1997). In the United States, major injuries to road users age 65+ were up 43% between 1980 and 1989 (Barr, 1991). By comparison, for those *under age 65*, injuries and fatalities decreased over the same time periods. When in a crash, the older person is more at-risk for injury or death than are younger persons. Statistics show that seniors are over four times more likely to be seriously injured than are drivers 16-24 years of age (Transportation Development Centre, 1997). The fatality rate for drivers 65+ is 17 times as high as the rate for drivers 25-65 years old, based on estimated annual travel (National Highway Traffic Safety Administration, 1996 from CCMTA). Thus, crashes, injuries, and fatalities to older drivers and their passengers have increased, and there is no reason to expect that they will not to continue to increase if effective interventions are not found and put in place.

A variety of interventions (media campaigns) and programmatic approaches (e.g., graduated licensing) to increasing traffic safety have targeted the causes of young driver crashes, some of which have been highly successful. However, these programs are not likely to be of the same relevance for promoting the safety of older drivers. This is because the crashes of young drivers tend to be due to excessive risk taking (drinking and driving, speeding, etc.), whereas few crashes of older drivers are due to risk taking behaviours.

The most common causes of crashes of older drivers are declines in the competence due medical conditions that reduce physical and/or mental abilities. Research indicates that there may be more drivers over the age 65 who have one or more medical conditions that might affect driving than there are drivers over the age of 65 who are without a potentially debilitating medical condition (Diller, et al., 1998). An Ontario study reported that one of the two best predictors of an older driver having had a crash during the previous five years was the presence of at least one medical condition (Tasca, 1996). When the medical condition(s) affects the driver's mental abilities there is special concern. Diller, et al. (1998) reported cognitive impairment to be associated with more than a seven-fold increase in the risk of an *at-fault crash*.

Medical conditions that affect the ability to drive safely also often affect insight. Because of this, those drivers for whom the mental decline has made them unsafe to drive are likely to be unaware of how dangerous their driving has become. This was clear from a study comparing self-ratings of driving ability with actual driving performance of drivers who had a dementia (who were continuing to drive). The same measures were obtained from a group of drivers who were cognitively normal (B. Dobbs, 1999). Despite the severely declined driving performance of the dementia group, 98% of the demented drivers rated their own driving as being as good or better than other drivers their own

age. In fact, the mean self-rating of the drivers with dementia was higher than the mean of the normal, healthy older drivers. As discussed by Dobbs and Dobbs (2000), this lack of insight means that we can not rely on the individual to appropriately monitor and regulate their driving in accordance with their abilities.

Identifying the Need. In 1991 physicians of the Northern Alberta Regional Geriatric Program in Edmonton, Alberta, Canada found the lack of effective procedures to evaluate driving competence to be a very serious impediment to providing effective and comprehensive care to patients. This was of special concern to Memory Clinic physicians who were well aware of the declining mental competence of many of their patients but unsure of the type and extent of decline that would render the person unsafe to drive. Given the limitations of the diagnostic and treatment tools at their disposal, they felt unable to meet the challenge of effectively and fairly identifying those who had become unsafe to drive.

Those physicians, led by Drs. P. McCracken and J. Triscott, approached the Neuropsychological Research Unit Directed by A. Dobbs requesting an interim tool and initiation of a research program for development of research based and validated driver evaluation procedures.

Development of a Scientifically-Based Driver Evaluation. The first step was to accommodate the immediate need. In the absence of a validated driver assessment, the stop gap measure was to develop a Clinical Driving Consultation process utilizing currently available professionals from Rehabilitation Medicine and Neuropsychology. Development of the consultation process began with a task analysis to identify the types of mental and physical abilities that contribute to the driving task. Selection of specific tests to measure those abilities was to be based on research evidence documenting at least a modest relationship between that test and driver performance. Unfortunately, the extremely limited research available precluded use of this criterion for all but a few tests. Thus, test selection was limited to the judgement of relevant professionals (Occupational Therapy, Neuropsychology, Cognitive Psychology, Nursing, Driving Evaluators). Not only was there a lack of evidence about the relationship between the specific tests and driving performance, there clearly was no evidence about the relationship between the selected set of tests, or even subsets of those tests, and driver competence. This precluded specifying an algorithm to combine test scores to set evidence-based criteria for pass and fail. It clearly was recognized that even after a client had completed the testing sessions (2 hours of Rehabilitation Medicine testing and 6 hours of Neuropsychology testing), the judgement about competence-to-drive remained a subjective evaluation by the neuropsychologist who "interpreted" the findings. Although limited, the assessment was not out of line with general practice (Korner-Bitensky et al., 1994).

The next step was the development and execution of the research. This involved the direct comparison of the driving of medically impaired and healthy competent drivers (N = 500). Three things were discovered: (1) A scoring system that weights the driving errors of medically compromised drivers in terms of their ability to differentiate those drivers from healthy competent drivers, (2) The rules shown by the research to define the conditions and manoeuvres necessary to reveal the important driving errors by the medically impaired persons, and (3) A criterion for designating the person as unsafe based on the unsafe driving errors being out of the range of normal. An in-office test battery was developed to assist in the identification of those unsafe to drive due to medical conditions that had affected mental abilities. All of the procedures were validated on an independent sample of 497 persons with a range of medical conditions that can affect mental abilities and an extended age range of drivers. The in-office testing and road test, together, provided a scientifically based and validated driver assessment for cognitively impaired drivers.

Research continues to play a central role. When the appropriateness of the evaluation was questioned for rural drivers (because it is administered on urban rather than rural roads), the data were examined retrospectively to answer the question empirically. A sample of rural living drivers who had received the DriveABLE evaluation were identified and matched on a one to one basis with urban drivers based on age, sex, and Mini Mental Status Examination score. The criterion was the rate at which the drivers were found to be unsafe, with the expectation that if the assessment disadvantaged rural drivers, they would show a higher failure rate. The failure rate for the two groups was less than 1 percentage point, providing no evidence that the evaluation processes disadvantaged rural drivers.

Making it Available. By the end of the seven year research period, well over 100 community physicians as well as the Alberta licensing authorities were referring to the research and considering the outcome measures in making decisions about the continued driving of their patients and clients. As is usual when research is ending, referring sources were notified and thanked for their participation and informed that referrals were no longer needed, nor could they be accepted. The level of negative response was unexpected and coupled with a strong plea to move the research to practice. The primary funding agency (Alberta Heritage Foundation for Medical Research) initiated a *Research to Practice* demonstration project to assess the need and reception of the stakeholders. The response was generally very positive, although there was resistance from some stakeholders. Independently, Alberta's Ministry of Health commissioned a study of the potential benefits of wide-spread use of the driver evaluation. The report concluded that between \$6 and \$8 million dollars could be saved if only *older* Alberta drivers and their crashes were considered and only a 5 percent reduction the crashes of those drivers was realized through the identification and de-licensing of the medically impaired and unsafe drivers. No estimate was made of the savings from removing younger medically unsafe drivers from the road. The support and apparent need encouraged the development of the driver evaluation as a service that could be made available across the province and elsewhere. The National Research Council of Canada provided funding to assist in the conversion and extension of the software. Finally, DriveABLE Assessment Centres Inc. was established to provide the driver evaluation service.

Getting it used. Soon after the service became available in major urban centres of Alberta, several challenges to its widespread use became apparent. The physicians who had championed the evaluation during the research tended to be those who sought out innovation. Moreover, although those physicians regarded diagnosis and treatment as the core of their practice, they also had a very strong commitment to investigating the patient's abilities to function at home and elsewhere, and the implications for public safety. This commitment meant that they were willing to endure hardships that otherwise could have been avoided. Those hardships turned out to be barriers to the wider use of the driver evaluation as not all physicians are willing to shoulder those burdens.

Although there are recognizable difficulties, physicians are well situated to provide early and cost-effective identification of persons who are at-risk for declining driving (and other functional) abilities due to their medical conditions. Both the Canadian Medical Association and the American Medical Association encourage physicians to conduct fitness-to-drive assessments. Given the critical role that physicians can play in identifying medically at-risk drivers and appropriately referring them for evaluation, it is incumbent on their associations, the appropriate government bodies, researchers and educators to provide the appropriate training, support, and information to assist in that role.

In participating in that role, physicians often express a variety of fears. It may be that these fears are the basis for the disparity between expressed attitudes about the physician's role in providing driver evaluations and their actual participation in this function. Generally, physicians who respond to surveys believe it is the responsibility of physicians to monitor patients for fitness-to-drive. A survey of physician members of the American Geriatrics Society (Miller & Morley, 1993) reflects this assertion in that 87% felt it was the responsibility of physicians to assess of their patient's fitness to drive. In contrast, however, only 21% of those physicians reported that they even kept records of their patient's driving status. A Canadian study (Baker and Puxty, 19xx) undertaken in a province having legally mandated physician reporting of patients unfit to drive showed that only 14% of the physicians regularly kept records of their patient's driving status. Perhaps the discrepancy between what should be the case and actual practice is not surprising given that there is a controversy about whether or not physicians should be responsible for identifying patients at-risk for driving declines (Odenheimer, 1993). Physicians also have written about how difficult it is for them to become involved in these decisions (Drachman & Swearer, 1993; O'Neill, 1992). One reason has been the concern about being able to fairly and accurately evaluate their patients given the lack of research validated driver evaluations (Drickamer & Marottoli, 1993). In fact, that was the impetus behind the research described herein and the development of the DriveABLE driver evaluation procedures. With this advancement, a scientifically-based and validated assessment tool is now available.

A fear of the physicians that has both therapeutic and economic consequences is that patients will change physicians if their physician provides a negative evaluation about driving and/or reports to the licensing authority. However, the fear of losing patients may not be as real as portrayed. In our own research, we contacted 120 caregivers of patients who went through the DriveABLE driver evaluation and were told to stop driving. Not one of the caregivers reported that the ex-driver had changed physicians. In a rural area with a large senior population, physicians initially wanted not to talk to their patients directly about driving, but instead to refer them to the regional hospital for assessment. Most physicians now take on that role, understanding that patients are unlikely to change physicians.

That patients do not change physicians is not to say that there is not a threat to the therapeutic relationship. This is one concern that is addressed by having an external evaluation. Physicians report that using the DriveABLE evaluation as a referral service has helped to reduce the threat to the physician-patient relationship. This is because the situation changes from having to say "I don't think you should drive" to a being able to say "The results from the evaluation have come back and we need to discuss them". Placing the evaluation at arms-length from the physician reduces the perceived culpability and threat to the relationship. In this sense, it serves as an external evaluation much as does a blood test, CAT scan, or other physician ordered test. Importantly, physicians also report that the scientific evidence backing the DriveABLE evaluation provided the needed confidence that the decision is the right one. This has helped to overcome the resistance of some physicians, whose reluctance was based on beliefs such as those reported by Drickamer and Marottoli (1993) and Miller and Morley (1993) that there were no clear criteria or validated assessment tool to enable evidence-based decision making.

System Changes. After about a year of the DriveABLE driver evaluation being available in Alberta, it became the standard used by Alberta Driver Records to evaluate the competence of drivers with medical conditions that could affect mental abilities. Because of this, DriveABLE served a unique role. On the one hand, it was the standard accepted and used by the Alberta licensing authority. On the other hand, DriveABLE was a private company and thus not a part of government.

Our experience during the research and the first year of providing the service made two things very apparent; (1) medically at-risk drivers are ill and need medical attention, and (2) the need to stop driving often has consequences broader than mobility, and coordination by someone in the health care system can be of considerable benefit to the person and their caregivers. Unfortunately (or perhaps fortunately), we have found the need to stop driving is often the catalyst that exposes the person's medical condition, that the illness is serious and may even be incurable, and there are likely to be serious consequences for the family as well as for the person. When a person's medical situation is serious enough to result in a 'stop driving' directive, abilities in other aspects of daily living and safety are likely to have been affected and to need attention. Drivers with Alzheimer's Disease provide a good example of this situation. Because of the insidious onset and relatively slow progression, the family often does not recognize (or admit) the decline may have a pathological genesis. The loss of driving privileges is a serious, concrete event making abnormal decline undeniable. Now the person and family must deal with issues far exceeding changes in mobility. These things may seem obvious, but they seldom are formally accommodated in driver licensing system. After our discussions about these issues with the Alberta licensing authority, they enacted an important change. It now is the case that when a driver receives a letter from Alberta Driver Records requesting a driving evaluation by DriveABLE, the driver always is instructed to schedule the evaluation through his or her physician. This has kept physicians informed and, importantly, has aided in the coordination of services and provision of relevant information to patients who have lost driving privileges.

Because of its unique role, DriveABLE often serves as the liaison between physicians and the licensing authority. Physicians have identified to us several barriers to their identifying and referring medically at-risk drivers for evaluation. For example, after reporting a person to the licensing officials, the outcome was never reported back to the physician. They also objected to the tone of the letter sent to drivers (their patients) when they were found to be unsafe to drive. The letter used language like "surrender your license" which implied they had done something wrong when in fact it was their illness that was to blame. These and similar issues have been identified through close and continued contact with physicians. Most necessitate only procedural changes, and the consequence is greater physician participation and increased road safety.

One important change to the system had to do with timing of license suspension if the person was found to be unsafe to drive. The policy had been to allow 30 days before the driver had to turn in their license. This meant that the person could continue to drive during that time and time allowance was tantamount to the licensing authority giving the person permission to drive for the 30 days. This policy may be suitable for drivers who have lost their license because of drinking and driving. The purpose would be to allow time for the driver find alternative transportation and make other needed arrangements, but clearly the intent would be that the person would not be driving while impaired by alcohol throughout that time. Unfortunately, drivers who are impaired by medical conditions affecting mental abilities are chronically impaired, meaning that they would be impaired during the 30 grace period. Clearly this is not appropriate for public safety, and may leave the licensing authority legally liable should that person be in a crash. In recognition of this, our licensing authority now has changed to immediate revocation of driving privileges for medically impaired drivers.

Being mandated by professional associations or legal authorities can be a benefit to physicians because it then is no longer a discretionary assessment, and this can be communicated to the patient. However, bringing up the topic of driving and communicating a negative decision to patients is difficult. To combat that difficulty, DriveABLE (A. Dobbs and B. Carstensen) in collaboration with a family physician (Dr. Jean Triscott) and a medical educator (Ms. Marie Cave) prepared a video on how to initiate a discussion of how the patient's medical condition

might be affecting driving safety, how to discuss driving cessation should that be the outcome of the driver evaluation, and who should be present during those discussions. The video is based on the Buchmann (Simpson et al.,) protocol for breaking bad news.

To further assist physicians, we sought a concrete way the physician could maintain an advocacy role with the patient through helping the patient family understand and deal with this new situation. The booklet “When you are concerned” developed and published by the New York State Agency on Aging (LaPoire, 2000) provided an excellent prototype. We have received permission to “Canadianize” and extend this booklet with an emphasis on evidence-based information, and it will be made available to physicians and other groups to distribute.

When a person is informed that they can no longer drive, there can be consequences that go well beyond changes in mobility. There is, perhaps, no more explicit marker of declining competence than the loss of driving privileges. It is no surprise that this loss is often accompanied by depression (Marottoli et al., 1977). Alberta Mental Health contacted DriveABLE about this problem and requested the development of some type of program to assist those who had lost driving privileges. In response to this, B. Dobbs has formed an interdisciplinary group to address the problem. Because the loss of driving privileges is an important issue both for the person and for the caregiver, parallel support groups are being developed, with the two groups coming together regularly to facilitate communication.

New Legal Issues. The Supreme Court of British Columbia recently made a ruling that has very broad implications. The case involved a person whose license was suspended because he did not meet the requirement of 120 degrees of visual field. A left-sided hemianopia precluded the person from meeting the requirement. The Human Right Commission of British Columbia accepted the case on the basis that the person was denied his license based on a disability. The ruling was in favor of the claimant, with the judge making several qualifications of direct relevance to licensing issues. First, the judge ruled that a person must not be denied driving privileges based on a disability, which includes medical conditions. Second, licensing must be based on an assessment of the individual’s abilities. Third, these abilities can be assessed in new and individualized ways for any driver, but the standard of competence must not be higher for the person with a disability than for those without disabilities. Importantly, the judge noted that no one is 100% safe, therefore the criterion needs to be “reasonable road safety”.

The phrase “reasonable road safety” has caused considerable concern among licensing authorities. The Alberta licensing authority was able to rely on the DriveABLE procedures as defining reasonable road safety. This was possible because of the way the research was conducted and the data which provided the basis for the pass/fail criterion. Recall that the research included healthy cognitively competent volunteers whose driving performance during the road test defined the type and range of acceptable driving errors. This provided a scientifically-based definition of reasonable road safety. In the DriveABLE evaluation, only errors whose type, severity, or frequency exceed the range of errors for experienced cognitively competent drivers are identified as signaling competence declines. A failing score occurs only when person’s performance is beyond the range of “reasonable road safety”.

Concluding Comments. There has been a well recognized need for a scientifically validated driver evaluation. However, moving from the tradition of “expert opinion” based evaluations to science-based evaluations requires a shift in thinking. When the tradition was expert opinion, there tended to be the view that all road tests were more or less equal. The shift to science means that there can be standards beyond evaluator training, standards that apply directly to the adequacy of the evaluation itself.

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