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The Licensing of Older Drivers

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THE LICENSING OF OLDER DRIVERS

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Transportation Research Board
National Research Council
2101 Constitution Avenue, N.W.
Washington, D.C. 20418

FOREWORD

The Operator Education and Regulation Committee (A3B13) of the Transportation Research Board held a meeting on September 13, 1993 to address means by which licensing agencies can discharge their obligation to protect the public from those elderly drivers who cannot operate safely while assuring the mobility of those whose ability to drive safely is undiminished. Researchers and practitioners knowledgeable in the problems of driving by the elderly were invited to deliver presentations addressing specific aspects of the elderly driving problem: the nature of the problem, the needs it creates and recommended actions.

Each presentation was followed by a lengthy discussion in order to allow the presenter to benefit from the insight and experience of other participants. The papers that makeup the body of this report represent the results of that effort.

Participants

Meeting Chairman
A. James McKnight, National Public Services Research Institute

Committee Secretary
E. Wallace Timmons, American Automobile Association of Tidewater

Liaison, Committee on Safety and Mobility of Older Drivers
John W. Eberhard, National Highway Traffic Safety Administration

Liaison, Transportation Research Board
Richard F. Pain, National Research Council, Transportation Research Board

Presenters:
Jackie A. Anapolle, National Mobility Institute
Raymond D. Cotton, Maryland State Police
Sonia Coleman, National Rehabilitation Hospital
Alma M. Fonseca, Texas A&M University
Donn W. Maryott, New York State Department of Motor Vehicles
Thomas L. Miller, University of South Florida
Anne L. Morris, American Occupational Therapy Association
Carol L. Popkin, North Carolina Health and Natural Res. Dept.
David Shinar, Ben Gurion University of the Negev
Loren Staplin, The Scientex Corporation
Carmella M. Strano, Moss Rehabilitation Hospital
Douglas K. Tobin, Pennsylvania Department of Transportation
Mary L. Vinsant, North Carolina, Driver Medical Evaluation

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THE LICENSING OF OLDER DRIVERS

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OF TRANSPORTATION FACILITIES

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FOREWORD

The Operator Education and Regulation Committee (A3B03) of the Transportation Research Board held a meeting on September 13, 1993 to address means by which licensing agencies can discharge their obligation to protect the public from those elderly drivers who cannot operate safely while assuring the mobility of those whose ability to drive safely is undiminished. Researchers and practitioners knowledgeable in the problems of driving by the elderly were invited to deliver presentations addressing specific aspects of the elderly driving problem: the nature of the problem, the needs it creates and recommended actions.

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INTRODUCTION

A. James McKnight

The challenge to the highway transportation system presented by elderly drivers has been well documented in the Transportation Research Board's "Transportation in an Aging Society." Increasing numbers of older citizens being increasingly dependent upon automobiles for transportation translates into an estimated two-thirds increase in elderly licensed drivers by the year 2030. The "old-old" group of elderly drivers is expected to experience a three-fold increase in size over this period of time.

Increasing numbers of drivers will be accompanied by an increased dependence upon the automobile for transportation. In the 85-plus age group, use of private automobiles relative to other modes of transportation increased by over 10% in the five-year period 1977 - 1983. Such a shift suggests that the annual mileage compiled by that age group will rise by considerably more than the three-fold population increase. A substantial mileage increase in a segment of the population whose per-mile accident rate approaches that of teenagers presents an obvious threat to the safety of the motoring public.

Much of the burden for controlling the threat represented by elderly drivers falls upon State driver licensing agencies. It is the licensing process that is expected to limit the access of unsafe drivers to the public streets and highways. However, licensing authorities recognize that, with today's dependence upon automobiles for mobility, driving has assumed the stature of a basic right, to be restricted or withdrawn only where continued driving creates a clear and present danger to the public. The dilemma that this situation creates for licensing agencies has been difficult for its agents to resolve. Any attempt to accommodate declining abilities with more extensive testing, or through restrictions in amount or kind of driving, inevitably encounters the individual and collective resistance of the elderly. Yet, when the cause of a serious accident is revealed to be an elderly incompetent, the licensing agency is inevitably called to account.

The papers presented in this report encompass the three principal functions of the driver licensing process as it addresses elderly drivers:

- Screening Processes;
- Corrective Processes; and
- Support Processes.

Each paper examines an individual process within a particular function, describing the *problem* giving rise to the process, the *needs* that the process must satisfy, and the actions that must be taken to meet those needs.

SCREENING PROCESSES

Before licensing agencies can take action to lessen the threat to public safety presented by age-related deficiencies, the nature and extent of those deficiencies must be assessed. Only then is it possible to take measure that will achieve the best possible balance between the safety of the public and the mobility of the elderly driver. Screening processes include:

- Driving Performance;
- Functional Capapbilities;
- Medical Evaluation;
- Vision Screening; and
- Use of Traffic Records.

SCREENING FOR DRIVING PERFORMANCE

Carmella M. Strano

Problem

The driving task is based primarily on information received through the visual system. Decisions about the driving environment are then made based on the processing of this information. As we age, both vision and visual perception, as well as information processing skills, deteriorate. Tests of visual acuity are performed routinely by State licensing agencies both for the new driver and as part of the random re-testing of older drivers. However, studies have not shown a clear relationship between visual acuity and accident occurrence. The same is true of clinical studies which have attempted to predict driving performance based on perceptual test scores.

In recent years, there has been increased interest in the use of simulated driving tests as a way of screening driving performance. However, the older driver has difficulty relating actual driving to a simulated traffic scene.

The most commonly encountered problem driving behaviors that we have observed in working with older drivers include poor judgement in making a left-hand turn, drifting within the traffic lane, and an inability to change behavior in response to an unexpected or rapidly changing situation. Frequently, even though the older driver intended to make the correct maneuver, it is executed so slowly that the traffic pattern has changed before the maneuver can be completed. They are then unable to re-assess the situation in sufficient time to correct their course of action.

Needs

A behind-the-wheel driving test needs to be developed, one that requires the driver to operate a motor vehicle in traffic situations which will elicit these problem behaviors. While it would be possible for State licensing agencies to acquire properly equipped vehicles and receive training in their use as well as in the physical conditions frequently associated with the aging driver, it would seem that a more efficient and cost effective method of providing performance testing would be to contract this service to existing Driver Rehabilitation Programs. These programs are staffed by personnel who have an allied medical background, have the properly equipped vehicles and are State licensed driving instructors.

But how can the State identify which older drivers are in need of retesting of their driving ability? The one factor that most persons, particularly the elderly, seem to have in common is a physician. Therefore, the most practical solution, without discrimination by age, would appear to be through physicians. In fact, many elderly clients now seen in driver rehabilitation programs have been referred by their primary care physician. Pennsylvania is one of the States with what is commonly called a "physician's reporting law." This law requires reporting of disabilities that may affect driving ability. Problems associated with a physicians's elderly patients such as memory deficits, confusion, generalized muscular deterioration and visual changes, would appear to fall within the requirements of this law.

Compliance with the reporting law has been scattered. This is particularly true of eye care specialists who are aware of vision changes that may affect driving but usually do not report such changes to the State. Many physicians are unaware that such a law even exists and even among those who are aware of their responsibility under the law, there is confusion as to their role in complying and just how the process works. Moreover, physicians are reluctant to report their patients for fear of jeopardizing their relationship with their patient. Elderly persons are also reluctant to appear for a State retest when they discover they will be required to submit to a knowledge test in addition to a driving test. For these reasons, it has been our experience that patients and physicians alike frequently prefer to have driving skills assessed by hospital operated driver rehabilitation programs. These programs rely heavily on behind-the-wheel performance in actual traffic situations. Most elderly drivers are

confident they still possess the skills for this type of performance test. Unfortunately, this is a service for which the fee is not covered by Medicare. This then places a financial burden on the elderly driver.

Actions

1. Develop nation-wide uniform physician reporting requirements.
2. Fund a feasibility study to determine the efficacy of contracting driver performance testing of older drivers to Driver Rehabilitation Specialists. Driver Rehabilitation Specialists acting as agents of the State should also be free of the threat of lawsuit as are the current driver licensing personnel.
3. Research needs to continue in the development of easily administered dynamic visual acuity testing apparatus and driving test standards. As an interim measure, visual acuity and visual field tests should be performed on all drivers over a pre-determined aged each time a license is renewed.

SCREENING OF DRIVERS' FUNCTIONAL CAPABILITIES

Loren Staplin, Ph.D.

Problem

Estimates of the variance in accident involvement accounted for by *operator inattention* or *information processing deficiency* range from 40 up to 70 percent. In other words, an individual's "functional capability" may be as important a predictor of accident risk as roadway, traffic, and weather conditions combined *plus* performance on other, traditional measures of driver capability such as the battery of vision tests used in most states. As policies for restriction of licensure evolve in various jurisdictions across the U.S., they should fairly reflect the most safety-relevant aspects of driver performance. The processes underlying timely and appropriate vehicle control actions, particularly in imminent-conflict situations, must therefore be a central element in future screening programs. As elaborated below, these processes may be conveniently grouped under the headings of *perceptual, cognitive,* and *psychomotor* response functions.

Driving, of course, is at times a highly complex task where vehicle control decisions must be reached and acted upon within a severely constrained timeframe. Both the speed of response and correct response selection are critical for effective performance; thus, it is important to address the antecedent processes involving working memory, divided attention, selective attention, and pre-attentional mental activities. As one example, the unprecedented strength of relationship of "useful field of view" deficits to elevated rates of intersection accident occurrence indicates the importance of maintaining a stable, criterion level of performance on a centrally-located visual processing task while simultaneously being able to rapidly and accurately perceive targets which appear unexpectedly outside of the foveal viewing area.

Increasing age, particularly for "old-old" drivers in the 75+ group, is strongly associated with functional deficits for a wide array of key perceptual, cognitive, and psychomotor capabilities. The useful-field-of-view measure, noted above, is but one index of performance that shows a systematic decline with advancing age. Older drivers, on average, are slower to locate and to extract the most relevant cues from traffic control devices or from the behavior of other motorists when viewing a visually-cluttered roadway scene. Visual distraction is more of a problem with this group, especially in unfamiliar environments. An overall slowing of perceptual and cognitive functions leads to disproportionate increases in many types of performance errors at faster driving speeds for older versus younger persons. When nothing unexpected occurs, older drivers demonstrate a reaction time that is only marginally slower than their younger counterparts; in an emergency situation, however, the first — and every subsequent — maneuver required of a driver to avoid a collision will take progressively longer for older persons to perform. In short, the likelihood of significant functional decrements with increasing age is high, and older motorists represent the fastest-growing segment of the driving population in the U.S.

While the deficits in functional capability demonstrated by a particular older person may be appalling to those who share the roadway, many other motorists in this age cohort will be functionally equivalent to the mean performance levels of drivers in their early middle-age years. This is a crucial finding: *on average* older drivers will experience a serious deficit in one or more functions needed for safe and effective vehicle control, but the variability in performance also rises dramatically with age. It will therefore not only promote the overall goal of highway safety, but also can help to avoid potentially discriminatory, age-based regulatory policies, to develop and validate screening processes that identify individuals whose functional impairment(s) place them at significantly higher risk of accident involvement.

Needs

To address such a sensitive problem, functional screening for older drivers must build upon a research base which indisputably links differences on individual tests and test batteries to differences on safety-relevant performance criteria, including — but by no means limited to — accident occurrences. Surrogate measures such as brake and/or steering response latencies in emergency maneuver situations, gap acceptance for turning movements at intersections and other high conflict scenarios, and a variety of maneuver decisions under real-world task loading levels and time pressures define additional criteria which may serve as important discriminators in licensing qualifications assessments.

To establish the empirical validity of functional screening indices, access to large data sets of accident records subject to fine-grained analysis is needed, as a start. Even given this information, and assuming sufficient resources to permit the careful measurement of functional capabilities for appropriate samples of drivers, the events just prior to an accident — including operator actions (or inaction), as well as vehicle movements — may not be described with enough specificity to allow meaningful correlation with screening results. Clearly, any expectation of linking observed differences in functional capability to accident likelihood without understanding the role of situational factors which define the performance context is naive.

As one possibility, studies providing for the simultaneous (video) recording of highway events and driver (vehicle control) behaviors, with individuals who have undergone extensive functional testing, could help pinpoint *which functions in which contexts* are most safety-critical, and what magnitudes of deficits must be experienced before problem behaviors become significantly more likely.

Aside from the obvious need for empirical validity in the subsequent implementation of functional screening measures for licensing decisions, the face validity of such tests also merits careful consideration. Older drivers' self-awareness of declining vision, together with the high face validity of vision testing to safe driving performance, makes license restrictions on this basis socially acceptable; deficits in perceptual, cognitive, or attentional functions more often go unnoticed by an individual, and the relationship of, say, a deficit on a laboratory measure of divided attention capability to traffic safety may also be less apparent. Elderly motorists who are confronted with the loss of dignity as well as mobility that results when driving privileges are restricted or revoked will arguably be more likely to accept and comply with policies based on face valid testing procedures.

It may be noted that emerging, sophisticated but economical simulation technologies, including low-cost PC-based multimedia testing and training systems, offer the possibility of rigorous and standardized functional screening using the (dynamic) presentation of familiar elements of the driving scene. An approach to licensing assessment that fully exploits current technology in this area could address the need for face validity, while necessarily incorporating the crucial contextual variables mentioned earlier.

Actions

The logical focus of activities to advance driver screening for functional capability is at the state level, through research initiatives and pilot programs which can be undertaken in a given jurisdiction without the need for new legislation. When the most valid protocols and procedures are thus identified, a mandate for uniform practice may be established. Specifically, the goal of developing functional screening techniques to reliably identify the most at-risk drivers, without bias and without explicit reference to an individual's chronological age, could be advanced by:

- Fostering a broad awareness of task analysis outcomes indicating driver perceptual, cognitive, and physical requirements in specific problem situations, prioritized through accident analyses.
- Obtaining additional, real-time data describing problems in drivers' behavioral responses to specific highway events, where differences in vehicle control effectiveness can be explained in terms of differences in one or more functional capabilities.
- Validating functional screening results through correlation with accident databases where incident analysis has coded contributing driver factors in sufficient detail to permit determination of "most causative action" (or event).
- Establishing consistent accident reporting, analysis, and coding procedures across jurisdictions.
- Incorporating isolated functional testing protocols into a unified program which presents meaningful test stimuli embedded in everyday driving scenes and situations, and employs familiar vehicle control responses as required under actual operating conditions.

MEDICAL EVALUATION

Mary L. Vinsant, M.D., M.P.H.

Physicians are faced with the responsibility of medically evaluating an older driver population that has experienced rapid growth and a higher crash rate per mile driven. On top of this, older persons are more likely to have a single infirmity or multiple chronic

illnesses and exhibit considerable variation in age-related physiologic changes. These age-related changes, part of the normal aging process, are characterized by a decrease in visual perception, cognition, and psychomotor function, skills which are essential for the driving task.

Problem

Currently, there is no specific way to reliably distinguish between safe and unsafe older drivers, those who pose an undue risk to themselves and others. This task of identifying high risk drivers is especially difficult because most states do not require mandatory reporting by physicians of individuals with medical conditions which may potentially interfere with safe driving. We must depend on state reporting systems to identify drivers in need of further medical examination.

Drivers evaluated medically are brought to the attention of licensing agencies in a number of ways. These drivers may respond positively to questions concerning a history of seizures, diabetes or alcohol-related problems at the time of initial licensing or at drivers license renewal. They may also relate other medical illnesses which may adversely affect driving. Driver license examiners and police officers may request evaluations of individuals in apparently poor physical condition or drivers involved in vehicular crashes where medical illnesses may have been contributory causes. In addition, accounts of medical problems may be submitted by physicians, concerned family or neighbors which may trigger the issuance of appropriate medical documents. Reports from the courts of adjudications of incompetence or involuntary commitments for the treatment of alcoholism and/or drug addiction may also prompt a medical evaluation. Additional cases may be referred by agencies that provide services to people with blindness or other disabilities.

With regards to the medical evaluation itself, we must rely on a comprehensive, multidisciplinary approach utilizing primary care physicians, those treating the elderly on a routine basis, along with other health care and rehabilitative specialists. These health care professionals have the task of identifying illnesses and/or normal physiologic changes related to the aging process that may interfere with safe driving. The information gathered is forwarded to state licensing agencies who with the aid of Medical Advisory Boards make the final licensing decisions.

The physician through a comprehensive history, physical examination and indicated laboratory tests is responsible for identifying medical conditions that may impair driving performance. Many physicians are hesitant, however, to assume this role due to a lack of validated, reliable instruments or guidelines outlining the appropriate medical procedures for determining driver capability. Licensing agencies may facilitate this undertaking by providing physicians with copies of state guidelines, statutes and all relevant driver history data on each driver being evaluated, including driving records and concerns about crashes where medical illnesses have been cited. Physicians can use this information to aid in the formulation of opinions regarding the driving capabilities of the medically impaired.

Physicians can utilize their history taking skills to obtain information on functional status, the ability to carry out the activities of daily living in the presence of age-related physiologic changes and ailments. Information on driving habits, including if the individual drives, self-imposed restrictions, crash or near-crash experiences and the type of vehicle driven must also be obtained.

One must keep in mind that the gross determination of functional ability may overlook potentially milder impairments which would interfere with safe driving. Examples of these subtle impairments that might not be detected by instruments developed to assess activities of daily living include reaction time and tracking.

The physical exam needs to assess the degree of age-related physiologic changes and the presence of disorders common in the elderly which may impair safe driving. Included among these are decreased hearing and vision (cataracts, senile macular degeneration, open-angle glaucoma and diabetic retinopathy), reduced reaction time, cardiac disease (arrhythmias, atherosclerotic and ischemic heart disease), pulmonary disease, diabetes mellitus, neurologic diseases (stroke, syncope, seizures, neuropathies, Alzheimer's disease and Parkinson's disease), sleep apnea, arthritis, alcohol use and polypharmacy (Reuben 1991). Routine vision screening including static visual acuity and confrontational visual field examination should be obtained as part of the physical examination, with more extensive evaluation by vision specialists if indicated.

Potentially treatable and disabling problems cannot be dismissed as normal aspects of aging. Physicians have the duty and obligation to treat these impairments, to reverse or minimize the impact of disease and ultimately lessen their effects on driving performance. Along these lines, physicians must periodically assess the course of disabling disorders and attempt to minimize their progression as well as the total number of medications prescribed with their resultant side effects.

Clinicians may experience some difficulty in assessing the degree of functional impairment present when relying on their training using the medical model.

This is especially true when physicians must determine overall functional ability in the presence of multiple, interacting medical conditions with variable expression.

Needs

Validated, reliable diagnostic procedures and tools are needed to assist physicians in diagnosing the extent of functional impairments present which may impact on driving ability. These instruments will enable physicians to concentrate on functional ability, not the degree of physiologic derangement present. The states of Maine and Utah (1992) through their physician guides have attempted to stress functional ability, regardless of medical impairment, as the key to determining driving limitations and follow-up intervals.

The physician's input in the areas of unexpected medical events and changing medical conditions which may have profound effects on driving is crucial. For example, it is important to know the likelihood of recurrence of an epileptic seizure or syncopal episode as well as the severity and frequency of arthritic flare- ups. Wallace and Retchin (1992) also point out the importance of looking for potentially irritating signs and symptoms including urinary incontinence, dermatitis and leg stiffness brought on by immobility which may distract a driver's attention. The clinician can also provide valuable information about the need for follow-up and follow-up intervals in cases of potentially progressive disorders.

Physicians play an especially critical role in helping identify and in evaluating drivers with dementia. Their input is extremely important as those individuals with significant cognitive and perceptual impairments are often unable to judge their limitations and the need to alter driving practices, unlike most older drivers who tend to modify their driving habits in the face of potentially impairing conditions.

A detailed procedural approach for diagnosing and treating the more common diseases in the elderly is beyond the scope of this paper. This can be easily found in any of the fine textbooks on geriatric medicine. An attempt at outlining the major steps in the diagnosis and treatment of the more common diseases would run the risk, due to space constraints, of failing to stress the presence of multi-system pathology and their resultant effects on driving performance.

Further evaluation by occupational therapists skilled in driving evaluations is advisable to complete the assessment in individuals with significant medical impairments and in determining the need for adaptive equipment or driving restrictions in borderline cases. Testing may vary from site to site but can include examination of strength, range of motion, tone, coordination, vision (visual acuity, traffic color recognition, field of vision, night vision, glare recovery, depth perception and perceptual processing time), reaction time, cognition (sign recognition, attention/concentration, memory, planning and organizational skills), performance on a driving simulator (threat recognition, night driving and crash avoidance) and an on-the-road driving exam. These tests also have the added benefit of identifying impairments that may respond to training.

In the majority of states, the clinical information submitted by the physician to the licensing agency is reviewed with the assistance of a Medical Advisory Board that provides medical expertise to the licensing authority. Further clarification of the driver's functional status and driving skills may be obtained by the Medical Advisory Board through consultations with specialists, from the results of written tests, sign recognition tests and road tests administered by the driver licensing agency. The final driver's licensure decision is left up to the licensing agency.

Action

Physicians bear the major responsibility in assisting licensing agencies in assessing driving risk. It seems appropriate to ask doctors to assume this role because of their medical training in the identification and treatment of disease states. This duty becomes especially formidable, however, when you consider that a driver's functional status is only loosely related at best to any 'physiologic derangement' present and that very few physicians have received any training to prepare them for this role. Clinicians need guidance and data that relates disease states to functional ability.

To assist physicians with this role:

1. Further studies are needed to determine the impact of disease states on driving ability.
2. Continued research is needed in the development of tools to assist the physician in the accurate determination of the extent of functional disability associated with various diseases and to reliably assess functional ability with changes in disease severity.
3. Physicians must be made aware of the latest research findings and the lack of studies outlining the driving risk associated with various disease entities.
4. Driver licensing agencies must furnish physicians with complete, understandable reports of current driver

status including reports detailing potential medical concerns.

5. Family members must be sought to provide valuable information on functional ability and to serve as allies when appropriate measures must be taken to prevent driving in the high risk elderly.

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VISION SCREENING

David Shinar, Ph.D.

Problem

1. Failing visual-attentional abilities of older drivers. Most perceptual-motor skills deteriorate with age, and the complex visual-attentional and oculo-motor functions do so at a faster rate and begin at an earlier age than the sensory-peripheral and static functions, such as static foveal acuity. This has been shown for dynamic visual acuity, dynamic contrast sensitivity, and effective visual field. Associated with the age-related average decrease in performance is the increase in individual differences.

2. Elderlies' lack of awareness of their reduced ability. Because the deterioration is typically gradual, visual impairments are often not detected in the process of daily living activities, but only through clinical and functional assessments (e.g., glaucoma and scotomas, respectively).

3. Need of license to retain independence and mobility. Based on self-report surveys people who lose their license and stop driving tend to reduce their activity levels in terms of visiting friends and relatives, shopping, going 'out', and going to church.

4. Cost of vision re-assessment, and lack of agreement on appropriate standards. Licensing agencies are reluctant to introduce any new vision screening criteria that would prolong the test duration to beyond one minute. Static foveal acuity under optimal illumination is currently the accepted standard. There is also no consensus in the research community on (a) the best alternative or additional test(s), (b) the pass/fail standard for these test(s), and (c) recommended action for those who fail the test(s). Consequently it is still legally irresponsible for a DMV to change the vision licensing standards.

Needs

The problems described give rise to three major needs.

1. Public education of older driver's low involvement in crashes, importance of license for mobility, and the elderlies' self limiting behaviors. Despite their relative dearth, older drivers' accidents are very salient in the media - which tends to highlight the age factor. Possibly because they drive slower, there driving behavior may also be annoyingly conspicuous to much of the motoring public. However, it would be interesting to assess public awareness of the actual low frequency of older driver crashes, the criticality of driving to mobility, and the need for tolerance, because there but for the grace of a few years, go.

2. Education of older drivers on detecting vision problems and compensating driving strategies. Many of the drivers who voluntarily limit their driving exposure (or stop altogether), do so because the detect their own limitations. But it is possible to introduce some quick gross 'tests' that can serve people as 'rule of the thumb' indicators of their visual ability. For example, it is easy to determine the snellen equivalent of 20/40 for the distance from which license plate numbers should be readable; and self test for horizontal visual field.

3. More conclusive research on the potentially relevant visual functions, performance requirements for each, and implications for license restrictions. Intensive research underway now includes evaluations of Useful Field of View (UFOV), Contrast Sensitivity, Low-Contrast Acuity, Dynamic acuity, and Dynamic contrast sensitivity. The UFOV is most significant because it is taps both visual-sensory skills as well as oculomotor and attentional skills. Older drivers in particular should be evaluated on the combination of the latter two skills, since these tend to deteriorate most rapidly.

Since vision alone cannot — even theoretically account for a high proportion of accidents — the

research community should agree on surrogate measures for validation of visual skills and vision tests. There is a need for uniformly accepted behavioral performance measures that would be considered safety-related. There is a need to validate the new vision tests relative to these measures. And there is a need for large scale research that would simultaneously evaluate multiple measures, to eliminate redundancies.

Actions

The following actions are recommended:

1. Develop simple self awareness tests - and test kits - to check on some of the simpler critical functions such as contrast sensitivity, acuity, visual field. The use of these tests can then be promoted through AAA, AARP, and AAAM.

2. Promote annual or bi-annual clinical and functional vision tests with inclusion of tests for specific diseases (cataracts, lens opacity/transmission), retinitis pigmentosis, scotomas, glaucoma.

3. Evaluate the cumulative experiences of states with different programs for elderly drivers. Mobility needs and patterns are not the same across the nation, and different licensing approaches are emerging in several states. A compendium of the existing alternative approaches with information on their successes and benefits should be written and disseminated to all DMVs.

4. Conduct/continue research on:

   a. Relevance of different visual skills to specific driving maneuvers (rather than accidents).

   b. Effective compensating behaviors - e.g., head turning, mirror checking, for reduced visual field; directing gaze away from glare sources to overcome phototropism.

   c. Continue research on association between accident involvement and performance on selected vision tests including contrast sensitivity, divided attention, effective visual field (Useful Field of View), and dynamic acuity and contrast sensitivity. The tests should focus on older drivers, and should control for co-morbidity.

5. Until there is sufficient conclusive data on alternatives to the 20/40 acuity standard, state licensing agencies would do best to set up an expert panel who will issue recommended guidelines for state DMVs. The current vision-related licensing recommendations can serve as a starting point. The panel's role would be to update the recommendations in the following areas:

   a. The indications for waivers and variations from the standard (whatever each state's standards are).

   b. Recommended additional tests, relative to the referral issues and observed impairments (candidates include tests of visually-based divided attention, glare sensitivity, and contrast sensitivity).

   c. Recommended limits on the license (including range of driving within residence, hours of driving, and speed of driving, and road types).

USE OF TRAFFIC RECORDS TO IDENTIFY HIGH RISK DRIVERS

Carol L. Popkin, M.S.P.H.

Identifying a method for detecting drivers with functional impairments that may affect their ability to drive has long been the goal of driver licensing authorities. The use of traffic records to identify high risk older drivers is attractive given that there is great individual variation in driver performance decrements, that older drivers constitute the fastest growing proportion of the driving population, that there are limited resources for screening drivers, and that traditional methods for identifying drivers at risk are changing, i.e., new license renewal procedures have meant that the period of time between visits to license examiners is increasing. However, the question remains "Is there a cost effective model that can be employed to better predict future crash involvement so as to permit pre-crash intervention through reexamination, retraining and/or driving restriction?"

Problem

Compared with other age groups, older drivers have relatively few crashes. In general, their crash risk does not exceed that of the general driving population until around age seventy. There is a substantial body of research indicating that when driving exposure is taken into account, the crash rate of older drivers begins to rise around the age of fifty and increases sharply around the age of seventy. As in other age groups, only a small portion of this population experiences a crash or violation within a particular year, and most crash-involved drivers have 'clean' records in the year following a crash.

Identifying that group of older drivers who are at elevated risk is especially important because older drivers are more vulnerable to injury when involved in a crash. Unfortunately, identifying driving impairment and predicting crash risk is especially difficult because decrements in driving ability occur in an unpredictable fashion and there is not definitive age after which one should not drive.

There is a complex interaction between age and decrements in driving performance. Several physical and mental changes may occur during the aging process that may adversely affect functional driving ability. These include loss of visual acuity, declines in glare recovery ability, peripheral vision, and various attentional factors that affect information processing speed. However, because older drivers have an increasing number of physical problems does not necessarily mean that they are poorer drivers. Most older drivers are aware of these changes and moderate their driving to times and circumstances that present the least risk.

Identification of drivers who may have functional driving disabilities has traditionally been the responsibility of driver license examiners. While this approach is central to driver licensing, there is a trend in this country to extend both the license renewal period and to permit license renewal by mail of those with 'clean' driving records. Thus, it may be over ten years between appearances in a driver licensing station. Furthermore, most people who are experiencing decrements in driving ability chose their 'best' day to appear for examination. These factors weaken the effectiveness of this method for identifying high risk drivers.

Due to the complexity of identifying age-related decrements in driving performance, a more useful predictor of crash risk in older drivers may be prior driving performance as recorded on the driving record. Many states use some combination of points accrued as a result of traffic violations or crashes to identify drivers who should be reexamined or sent for retraining at driver improvement clinics. There is justification for this action because research indicates that prior record is the best single predictor of crash risk (Gebers and Peck, 1992). With the exception of special programs targeting provisional licensees with poor driving records, criteria used to identify these drivers have been based on driving performance rather than on age-specific indicators. Only in the area of license renewal do some states use age-related criteria to determine the period of time between license renewal and reexamination.

Needs

In order to consider the feasibility of using traffic records to identify high risk drivers, three types of information are needed:

- Data on the availability of past driving records to predict future crash involvement in older persons;
- Data on the portion of the at-risk population that may be identified in this manner;
- Analysis of patterns of crashes and violations to examine the possibility that certain configurations might be better predictors of elevated risk;

A study by Gebers and Peck (1992) examined the ability of driving records to predict future crash involvement. It reports that "older drivers exhibit a steeper increase in future accident risk at successive prior incident levels, relative to drivers in general." Furthermore they found that a record of traffic convictions presents a higher risk of crashes for older drivers. Using these findings for support, California modified its existing algorithm for identifying older (age 70+) high-risk drivers to become activated at a lower number of incidents. California requires all drivers involved in a fatal crash or 3 or more crashes within a calendar year to appear for reexamination. Based on their findings that older drivers have an increased risk of subsequent crash, they changed their criteria for older persons so that older drivers experience two or more crashes within a 1 year period are required to appear for reexamination. Even though only one percent of older drivers are affected by this program modification, California felt that the anticipated reductions in crashes in this vulnerable group of road users justified the costs of the program.

Action

Clearly there is justification for using traffic records to assist in the identification of highest risk stratum of older drivers. Since crash records contain important information not only about the number of crashes but also about the details of the crash including crash configuration, time-of-day, roadway conditions, weather conditions, location, driver condition, and culpability, they provide data that may be useful both for assessing individual driver's crash risk and for identifying groups of drivers who have certain crash patterns that may present great risk after experiencing just one incident, e.g., stopped in middle of roadway. Computer identification may provide a low cost alternative to screening large groups of older drivers. However, further research is needed to refine this application to traffic records. For example, are older drivers who crash while turning more likely to have future crashes? Is there justification for reexamining drivers involved in certain crash configurations after one crash?

The use of traffic records to identify high risk older drivers should be part of a more comprehensive

program for identifying high risk drivers. However, such a program will never be able to identify the entire target population. Since most older persons have not had a crash within the preceding year, and since a large proportion of those older drivers involved in crashes come from this pool of crash free drivers, the effectiveness of using traffic records to trigger reexamination will be small but important. Yet, further analysis should enable licensing authorities to refine their procedures for recalling high risk older drivers.

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CORRECTIVE PROCESSES

Among a large segment of the public the best way to deal with drivers whose capabilites are diminished by age is to "get them off the road." In many cases this is indeed the only safe solution to the problem. However, in many more cases it is not. Where driving deficiencies themselves cannot be ameliorated their danger to the public can be moderated by altering the kind and amount of driving permitted. Such alterations are sought through the following corrective processes:

- License Restriction;
- Rehabilitation;
- Education, Counseling, and Alternative Trasnportation; and
- Training.

LICENSING RESTRICTIONS

Thomas L. Miller Ph.D.[1]

When considering a system for granting driving privileges, it becomes crucial to strike a delicate balance between the individual's need for maximum mobility and independence and the public's right to safety. While it is critical that all licensed drivers possess the ability to safely operate a motor vehicle, the population must be sensitive to people whose limitations cause hardships that result from the denial of the privilege to drive, especially where no other reasonably practical, accessible means of transportation exists.

Problem

Various human factors studies report that anywhere from 85% to 95% of highway crashes may be attributed to human error. It is logical to assume that there are some drivers who are licensed but nonetheless should be placed under restriction(s) or altogether removed from the highway environment. Many drivers develop limitations connected with age-related problems. Such limitations may be physical and/or cognitive. There is a need, then, to devise restrictions that address driver limitations, yet preserve the maximum possible mobility for each individual motor vehicle operator.

Perfection of "Intelligent Vehicle Highway System" (IVHS) innovations such as advanced vehicle control systems and advanced highway systems hold the promise of "hands-off" driving environments which will be safer for all highway users. Such automatic systems might remove the need for driver restrictions and represent the ultimate goal of safe personal mobility to which we aspire. In addition, recent federal legislation will help fund, among other things, expansions and improvements to make current public transportation systems more available and reliable. These improvements will provide more people with options besides using private automobiles. However, the widespread adoption of "hands-off" motor vehicle operation and a universally available public transportation system is forecast for sometime in the indeterminate future (Parker, 45).

Given the gap between the present and the time our futuristic transportation system will take over, coupled with the ongoing limited ability of public transportation to attract ridership, the private automobile is - and will likely remain - the predominant mode of personal transportation well into the next century. And, while highway crash fatalities are declining, we are still experiencing over 35,000 highway fatalities each year. Highway crashes represent the leading cause of accidental death for drivers age 65 to 74 (Osinski, 4F). Furthermore, one in three drivers will be older (over the age of 55) drivers by the year 2000 (Graduated Driver Licensing, 3). The issue of older driver restrictions is of emerging importance.

Needs

The main need affecting assignment of driving restrictions is more information. Little definitive information exists that shows the relationship of medical impairment to crash causation, and even less is known about the cut-off point at which specific impairment becomes an undue highway hazard (Bowdin, 54). The need for basic causative information is pervasive and is discussed in many of the related issues in this paper.

Medical conditions resulting in obvious functional impairment render individuals unfit to operate any automobile. Current screening programs, although applied differently across states and provinces, can identify those with gross functional impairment which prevent them from safely operating an automobile.

In our current system, persons suffering various degrees of functional impairment are the ones at risk for receiving either overly aggressive driver restrictions or no restrictions. They risk being denied a license to operate a motor vehicle when they could be driving using a restricted license or they risk becoming involved

in a crash because their driving should have been restricted. Routine medical examination of all drivers has not proven to be a cost effective means for resolving the driver impairment problem (Bowden, 54). And, even if it were cost effective, the question still remains as to what impairments are related to crash causation. Research linking functional impairments and crash causation is needed and would provide the basis for issuing driver licenses with appropriate restrictions.

The confidentiality of the physician/patient relationship causes the medical community to under-report persons who are unfit to be drivers. States and provinces vary widely in specifying what is to be reported, who is required to report, and if reports are authorized without liability (State and Provincial Licensing, 91). The physician's role in reporting potentially impaired drivers is unclear and must be communicated to the medical community. Medically acceptable and legally defensible criteria on which physicians can base decisions regarding an impaired driver's functional capability must be developed and communicated (Bowden, 55).

Differences in performance capabilities exist between new and experienced drivers. New older drivers with functional impairments and experienced older drivers who are adapting to losses of identifications/perception skills, predictive ability, decision making skills, or control functions need different driving restrictions. There is a need to devise a system to allow for driving experience when considering driver restrictions for individuals with the same or similar functional impairments.

States and Provinces have different classification systems, or names, for various driver license restrictions. And, when two classification systems appear similar, they often have differing criteria. Visual restrictions are a case in point. The definition of blindness varies widely across States and Provinces. There is a need to standardize the classification systems and their related criteria for all driver license restrictions. A standardized system of driver license restriction is needed to facilitate large scale comparisons and related effectiveness research.

Vision requirements and screening procedures are not uniform across states and provinces. The visual parameters that should be considered relevant to an individual's ability to perform effectively on the road include visual acuity, stereoacuity, binocular field of vision, color discrimination, strabismus (relating to potential diplopia), glare tolerance and recovery time (relating to twilight/night driving), and dark adaptation. However, visual acuity of 20/40 with or without glasses for both eyes or one blind eye is the predominant minimum standard required for unrestricted driving in the United States and Canada (State and Provincial Licensing, 30). And, few test for depth and color perception, field of vision, and bioptics. Differences in visual screening seem to be related to the lack of definitive information about what types and levels of vision are related to highway crashes.

Actions

- Initiate a study to see if current restrictions are well founded in research.
- Conduct a feasibility study to investigate standardization, across States and Provinces, of driver restriction classification systems and their related criteria.
- Develop research that will relate functional impairments and their associated driver restrictions to crash causation. Also, a scale rating the degree of functional impairments to crash causation should be developed. This will provide the basis for imposing driver restrictions and guide medical professionals in determining what driver limitations to report.
- Undertake research to standardize driver impairment and driver restriction terminology across state and provincial lines. Driver impairments, functional limitations and driver restriction codes must mean the same thing or, at a minimum, be able to be matched up before research programs are initiated.
- Modify crash reports to include data on operator license restrictions. The rationale and procedures for capturing this information should be incorporated into accident investigation courses taught to enforcement personnel.
- Communicate the role practicing physicians should play in reporting drivers who should receive driving restrictions. Issues such as the preservation of patient confidentiality and liability of the medical provider in choosing not to report should also be communicated.
- Determine the role of previous driving experience and factor it into driving restrictions imposed on drivers with the same or similar functional impairments.
- Utilize a more organized system of uniform, automated screening devices and simulators to effect a periodic driver screening process since complete medical evaluations for all older drivers would be cost prohibitive. A system should be designed to assure that those who are licensed as drivers are screened to meet some minimal medical or visual standard necessary to operate a motor vehicle safely. Such a regimented system would need to be tempered with a built-in mechanism for referral to an individualized or specialized medical review of the specific functional

impairments discovered in the simulation or screening process. This would help to prevent unnecessary limitation of precious driving privileges.

- Recognize and address issues concerning visual screening procedures and examiner awareness of the potential limitations and pitfalls of the visual screening process. These include variable performance with lighting/illumination conditions, memorization of test objects by examinees, use of concealed visual aids to overcome refractive disabilities (i.e., contact lenses), dependence of standardized signal positions and shapes to mask a visual limitation, and the use of telescopic low vision aids to pass tests of central acuity while severely compromising field or breadth of lateral awareness.
- Establish the relationship between types and levels of visual deficits and crash causation. This would provide the basis for visual restrictions based on crash probability.

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REHABILITATION OF ELDERLY DRIVERS

Sonia Coleman, M.Ed., OTR/L

When an individual tries to identify the common characteristics of an elderly person, several images come to mind. The elderly may react slower than other younger people in all areas - learning new tasks, accomplishing routine tasks, speaking and understanding what was said, responding to questions or comments. Sometimes the image is correct; sometimes it is not.

Problem

The elderly population suffer from more medical problems than other younger people. As an individual gets older, vision becomes more impaired. The variety of social and work related activities become more limited in the elderly population especially if physical impairments are present. The images and characteristics just described may not apply to all elderly persons, but are more prevalent among this population than other age groups. This paper will attempt to describe how health professionals can assist this population in improving their driving performance to overcome the above limitations imposed on them by the aging process. Considering an individual's lifestyle as well as measurable physical abilities, a plan for retraining and keeping the elderly driving safely can be formed.

Usually, people learn how to drive in their adolescent/young adult years. State law requires that they get relicensed at regular intervals without having to demonstrate continued satisfactory driving performance. An individual continues to drive until something drastic occurs which limits the person's ability to drive. Often, this drastic event is a physically disabling condition (i.e. a stroke, hip fracture, sickness, etc.). Individuals are less likely to limit their driving because of a mental disability as they often do not realize the impact mental/ cognitive functions have on driving performance. When people are forced to restrict their driving because of a physical impairment, health professionals usually see these people at the time they are questioning their ability to drive. What has developed is a comprehensive driving rehabilitation system offered through hospitals to evaluate and retrain persons to drive.

Needs

Health professionals, including occupational therapists, physical therapists, vocational counselors, speech therapists, optometrists, and psychologists can assist elderly persons to improve their driving performance or retain some type of community mobility to accomplish their daily needs. Occupational therapists (OT) work to enable a person to be as independent as possible. Usually, the driving evaluation and on-road training is administered by an OT because driving is an important activity of daily living for most people and allows them to be independent in community mobility. For those persons who have slow reaction times, occupational

therapists can work with them to improve their reaction times by participating in timed activities and/or utilizing compensatory strategies that may allow them to perform faster or remember important items.

Both the occupational therapist and the physical therapist can work to improve the strength in elderly persons arms and legs to enable them to operate the accelerator and brake better as well as get in and out of the vehicle better. Occupational therapists can assess the need for adaptive equipment for driving and then train individuals in the use of that equipment. For example, many elderly persons have arthritis. Simple adaptations to the steering wheel, gear selector, and pedals could make these people independent and safe drivers. Occupational therapists and physical therapists can evaluate an individual's sitting position in the vehicle and recommend/fabricate any equipment that may be needed to enable the person to maintain good sitting balance, visibility, and optimal comfort during the entire driving task. Occupational therapists can work with an individual on energy conservation techniques which may enable an elderly person to find the best times in the day, when they have more energy and are more alert, to do most of their driving. Occupational therapists and physical therapists can assist the elderly in exploring other transportation options by having them actually use the alternate system to give the elderly person the confidence they may need and the knowledge that despite their physical limitations, they can access public transportation.

While many elderly persons do not work, vocational counselors could assist the elderly person in finding volunteer activities within a certain distance from home or arrange hours so that no night driving is needed. A vocational counselor could also assist in finding alternative modes of transportation so that the elderly person does not need to depend on driving. Speech therapists can help to improve a persons ability to communicate with others if there are speech problems. Speech therapists, occupational therapists, and psychologists can work on cognitive strategies to improve decision making skills and increase their insight into how their driving might be affected by the deterioration of cognitive skills (ability to pay attention to important items, make quick decisions, etc..) Optometrists can assist individuals to overcome visual problems with various forms of vision training. Optometrists utilize specialized lenses and exercises to improve a person's ability to see. For example, a person with very limited visual acuity may be able to use bi-optic glasses to drive. These lenses greatly magnify areas of the visual field which can allow an individual to see specific objects in the traffic environment.

Most people who are able to access this evaluation and training system are already in the hospital for a medical problem which has impaired their physical and/or cognitive ability. There is a whole population of well elderly people who are missed because they have not had anything drastic happen or any life threatening on the road incidents.

There are several additional needs that must be met in providing access the services of qualified health professionals. First, the majority of well elderly people who could benefit from an evaluation, and possibly retraining to identify problems that may be hindering their driving performance, do not realize these services exist. They have no obvious problems that would bring them to a hospital or they may be concealing small problems from others for fear of restrictions on their driving. Second, the evaluation is usually very involved, taking at least an hour to complete, if not longer, for the in-clinic portion. The on-road portion can last from 1 to 4 or more hours. The individual has had to pay for an office visit to have the doctor request the evaluation. Third, the evaluation can be very expensive. The evaluations can run into the hundreds of dollars and medical insurance does not always cover these services. Many medical insurers feel that driving is not medically necessary and therefore will not cover the evaluation or training. A forth problem is that since hospital-based training programs are too expensive, many elderly persons may turn to commercial driving schools which are significantly cheaper and do not require a doctor's referral. Many commercial driving schools are not knowledgeable enough of all the conditions which affect older drivers. They may not be aware of the compensatory strategies available or be willing to take the time to retrain the elderly to drive more safely.

Action

Solutions to the above problems may be hard to find within the current health care system. As stated before, health professionals can help elderly persons overcome driving limitations by offering very specific and helpful services. Most have the knowledge of medical problems and how they might relate to driving as well as a repertoire of strategies to improve function. A specific section on driving rehabilitation needs to be added to the curriculum of allied health professionals to ensure that all health professionals in a particular field have the same knowledge base. Most therapists apply basic treatment techniques to driving rehab after entering the field and realizing how important driving is to many of their clients. The therapists then find a need for

additional coursework or continuing education on the issue of driving rehab especially for OT's when they provide the on-road training.

An effective action plan to satisfy the above needs would involve inclusion of driving rehab in the curriculum and collaboration and cooperation between the licensing agency and health care providers. First, the motor vehicle administrations could have some type of screening procedure to identify those persons at risk for problems with driving. These people would then be required to proceed to some type of qualified evaluation and training program staffed by driving rehab specialists or other professionals experienced in retraining techniques. The hospital-based programs would need to streamline services for the elderly population. They could do this by utilizing questionnaires and reports from physicians for tests already performed (i.e. eye exams). Once the in-clinic evaluation was completed, the health care professional could then work to devise a plan by referring individuals to an educational program (i.e. 55 Alive), to a health professional who could help overcome specific limitations (as aforementioned), or to a commercial driving school for on road training. The commercial driving schools should have a mandatory training course on the elderly driver so that they understand the various factors that affect driving performance in the elderly and ways to overcome them. Insurance companies should cover services related to driving and realize its importance in an individual's ability to accomplish daily tasks and that in the long run, it reduces accidents and claims that might be filed. If driving evaluation and training were more readily covered by medical insurance, elderly persons could get the individualized help they need to return to driving provided by health professionals. Another route to take might be to lower costs in general so that the driving rehab services are more affordable for those who need to pay out of pocket.

In an ideal world, the above may be attainable. With all the changes that are about to occur with health care reform, it is very difficult to say if any of this is possible. Health care professionals can greatly assist elderly persons overcome limitations in driving performance by taking a holistic view of the individual, realizing that many factors affect a person's ability and desire to drive. Health professionals consider all of these factors and in collaborations with the client and/or family develop a plan which helps retain the level of community mobility that is required to accomplish activities of daily living. Unfortunately those services are expensive and time consuming. I believe that by working together (MVA's, commercial driving schools, and health professionals) we can create a reasonable alternative which will satisfy the society's need of having safe drivers on the road and the individuals need of having a cost effective, efficient, and informative program for overcoming their limitations in driving and mobility.

EDUCATION, COUNSELING, AND FORMS OF SUPPORT

Donn W. Maryott

As North America's highway user population continues to mature, the need to help the group improve its driving, passenger, and pedestrian skills increases. Lives can be saved as traffic safety concepts are communicated to the many thousands of licensed senior drivers who are on the road today. Education, counseling, and transportation alternatives will make a difference and will lead to a reduction in fatalities, injuries, and property damage. Extremes in traffic, weather, and population density compound the problems and contribute to the likelihood of traffic collisions.

Education (Classroom/In-Car)

Problem

Senior highway users lack the knowledge, skills, and background to allow them to safely and efficiently travel in the transportation system.

Needs

Senior highway users require (1) skills to assist them drive, ride, and walk in the modern transportation systems, (2) a refresher/review of traffic and natural law, vehicle control, and (3) knowledge of age-related disabilities.

Actions

Federal, state, and local governments, and private sector components must provide seniors with traffic safety education classes. The program should include material focused on older drivers, riders, and walkers. These classes must educate seniors about the value of safety belts and other restraint systems, age-related disabilities and compensating behaviors, the effect of medications on coordination, vision, and the decision making process, alternative transportation, and support agencies to provide mobility. Additionally, right-of-way, traffic signs-signals-markings should be detailed to familiarize older

highway users with standardized and recent highway engineering innovations.

To have maximum positive impact, the education program should have classroom, simulation, and in-car components. While classes currently available (AARP, NSC, AAA, etc.) offer a strong classroom experience, they fail to give the learner the opportunity to practice behind the wheel or to demonstrate newly mastered skills and information. Without simulation instruction and practice, theory is often heard, but never conceptualized by the senior student.

The cost of a two or three component education program will be expensive. Seniors often learn at a slower rate than other groups in both the classroom and in the car. This will necessitate more instruction, highly trained instructors, quality materials, and responsive government. The expense of the program will be overshadowed by the bottom line savings ... crashes with the resultant injuries and fatalities. Seniors, insurance carriers, and government should share the financial burden of the education program. With increasing numbers of seniors, high-mileage drivers, and a complex traffic environment, a great deal of educating needs to be done.

Counseling

Problem

Senior drivers are often unaware of alternative transportation options or support groups to help them meet their diverse mobility needs. Older highway users often fail to take advantage of community counseling services, established to assist them in their everyday lives.

Needs

Senior drivers and pedestrians require counseling to advise them of their transportation options and to help them maintain/expand their level of independence. Both individual and group sessions are essential to meet the needs of seniors, as mobility requirements change with age and new lifestyles.

Actions

Community senior centers often serve as the focal point of neighborhood activity for older drivers and pedestrians. Because of their widespread availability, these centers are ideal to provide the necessary counseling services. The directors of the centers are aware of the local senior population, their mobility needs and deficiencies, and existing public and non-public transportation services.

A regular and continuing transportation counseling program should be established to assist area seniors of all ages, capabilities, and economic groups. In one-on-one or small group sessions, car pooling, public transportation, family resources, and center busing options can all be explored for individual needs. These sessions will familiarize seniors and their family members with available services and mobility offerings.

Large group counseling should be offered to provide a diverse audience with information about city/town services and programs. These sessions are ideal for those drivers and pedestrians who are generally capable of making personal mobility decisions.

Religious centers and agencies should be encouraged to provide counseling services. With trained staff and a long history of concern, the settings and facilities are ideal for providing the necessary assistance.

AARP chapters, with growing numbers and a strong desire to help, currently provide counseling and assistance programs to its members. This service should be expanded to include "mobility/ transportation options." With voluntary staff and an earned positive reputation, the basis of a supportive community program is in place.

Transportation Alternatives

Problem

Public and/or private transportation is not available to many senior highway users who live in rural and suburban areas. Without mobility, people are often isolated from their personal and business destinations.

Many seniors lack the financial resources to allow them to use their own vehicles or public/private transportation services. As the cost of vehicles, insurance, maintenance, and energy continues to rise, citizens on fixed incomes are further restricted from active participation in society. The cost of public transportation, as well, continues to rise. Transit companies have reduced rural scheduling on non-profitable routes. These factors combine to create a mobility crisis for many older citizens.

Needs

The senior community needs safe, rapid, convenient, and inexpensive transportation. In many rural and suburban communities, shopping malls have replaced neighborhood and small town stores and shops. Seniors, who are

already financially pressed, are forced to travel greater distances to purchase the goods of life and to mix with others in society. Public and/or private transportation is needed to ensure mobility and independence for a population that must depend on community assistance.

Actions

Public Transportation should be expanded to provide safe, rapid, convenient, and economical service to the total community. While citizens in all age groups would benefit, the people who have little or few alternatives to public transport would profit most. Senior riders need the benefits that public transportation can provide.

The majority of seniors live within range of a senior center operated by town, county, or state government. With a public need for expanded mobility, seniors can turn to their senior organizations and centers for help. Mini-vans, small buses, and automobiles must be mobilized to provide the necessary transportation to a variety of destinations.

The private sector stands to profit from increased senior mobility. Shopping centers from coast to coast have come to recognize seniors as major customers in an ever more competitive market. Older citizens, many with financial resources beyond their needs, spend millions of dollars annually on goods ranging from food and other necessities to pricey restaurants and boutiques. As the shopping centers have identified this lucrative and growing market, they must also recognize that their customers may need help to get to the retailers. An increasing number of merchants now run buses from rural and distant locations to attract business. The buses, either free or heavily subsidized, are operated on a scheduled basis so that buyers can travel with ease and in comfort from their homes to the retailers. This practice should be expanded through communications with area merchants and business organizations.

Similarly, churches should be encouraged to provide members of their congregations with transportation to and from places of worship. The vehicles used for this purpose can be utilized during other times to carry seniors to a variety of other locations.

Seniors who recognize that it is no longer safe to drive their personal automobiles, have the option of a "transportation co-op" in some areas. Car services, available to seniors, respond to telephone requests for local transportation needs. Rides are available for singles or groups with fees charged on a time and mileage basis. The drivers are known to the callers and provide an economical, clean, and safe alternative to taxi cabs. Car pooling has long been identified as a method to reduce traffic, fuel consumption, and to remove drivers from the road. While efforts have met with limited success in the majority of locations, there is a great potential to provide transportation services to seniors. A well-publicized and organized campaign to encourage car pooling should be implemented within the senior community. AARP, AAA, and senior centers could easily reach out to thousands of older citizens to spread the word.

TRAINING ELDERLY DRIVERS

Alma M. Fonseca, Ed.D.

Concern is growing over the ability of the aging population to drive safely. Motor vehicle injuries are the leading cause of accidental death for persons ages 65 to 74. Older drivers who suffer from declining physical skills eventually are unable to drive safely and become dependent on others for their transportation needs, thus losing cherished independent mobility. Some older drivers do recognize declining skills, such as reduced range of motion, but fail to take advantage of programs which can teach compensation techniques. Coupled with reduced physical abilities, lack of knowledge about the effectiveness of occupant restraints is an obstacle to safe driving. A negative attitude and overconfidence in one's ability to drive safely are also obstacles to safe driving.

Problem

While maturity and driving experience enhance driving ability, many experienced older drivers never completed formal training or developed safe practices. Older drivers often fail to (1) keep up with the latest traffic law changes, (2) adopt new safety measures, and (3) recognize physical changes that impair driving and learn skills to compensate for those changes.

Some of the driver improvement courses currently offered lack the content depth to meet specific needs of the aging driver in a complex driving environment. Other training programs offered in the past failed because instruction was not tailored specifically to older drivers. Current driver training programs, such as 55 Alive/Mature Driving and Coaching Mature Drivers, reach only a small fraction of the people who could benefit from them and do not include hands-on training to improve driving skills. Those who do participate tend to be drivers who already have unusually good records.

Needs

Particular measures must be taken to attract the older population, including the undereducated, the very old, the rural elderly, and the socioeconomically disadvantaged, to training programs to improve driving skills. Driver training instructors must (1) provide

instruction in proper procedure for older drivers who lack awareness of appropriate performance and (2) help older drivers compensate for perceptual and cognitive deficiencies by helping them anticipate and overcome the specific mistakes they are liable to make.

If it is not possible to teach all the content needed to fully address all the problems with which older drivers are confronted in the 8-hour length of the national programs, then organizations developing the programs should consider lengthening the programs. In-car instruction provides an effective way of identifying the specific deficiencies of individual drivers, both to the instructor and to the student. The American Automobile Association program, Safe Driving for Mature Operators, offers in-car instruction as an option but reports that only about 5 percent of the students elect to take it.

Some physical skills lost in the aging process can be compensated for through training and exercise. A positive attitude and openness to learning can lead to less defensiveness about declining driving skills and, thus, to swifter action toward improvement. What is needed to meet safety needs and resolve problems of older drivers are driver training and retraining programs tailored explicitly to older adults' learning patterns.

Two types of courses are needed for older drivers. First, refresher courses and periodic driver training are needed by experienced older drivers. Training can teach safe driving principles and changes made since most older drivers first learned how to drive. Second, a beginner's course for older drivers is needed. Data show an increasing trend of older adults who are learning to drive for the first time. Many of these older beginners are females who are recently widowed and will become responsible for their own transportation.

The decade of the 1980s brought national programs specifically designed to meet the physiological and psychological needs of the older driver, particularly the older driver with no formal instruction in driving. Programs being offered today have improved in content and methodology over those introduced in the 1960s and 1970s; however, more comprehensive information on occupant protection is needed. In some of the earlier courses, instructor guides included little or nothing about occupant protection. In light of the fact that the consequences of a crash are more severe for older drivers than for younger drivers and some studies have shown that older occupants have low usage rates, the implementation of older driver training programs related to increasing the use of safety belts is recommended. Class time must be allowed for older adults to practice proper use of safety belts in all positions of their vehicles. An Instructional Guide on Occupant Protection for Older Adults, developed by the author, can supplement an existing driver training course or be used to teach a stand-alone course on occupant protection.

Action

As the American population grays, the potential for an untapped consumer market for organized and informal training programs becomes greater. Significant steps toward increasing enrollment must be taken if training is to have a real impact on the safety of older drivers. Driver licensing offers an ideal point of contact for educational interventions because it is the only state program that has the potential for reaching all drivers on a routine basis.

Licensing agencies can induce drivers to enroll in and complete training programs through the renewal process. The state of Illinois offers a training program, "Seniors On the Go!," which combines classroom instruction with behind-the-wheel simulation experience where participants can practice driving skills. A special movie takes participants through a variety of driving situations, measuring such things as braking, signaling, and speed. Upon completion of the program, participants receive a performance printout. Personnel review the results with participants, pointing out safety tips to remember when on the road. Upon completing the course, participants can take a vision examination which, if successfully completed, entitles them to receive a certificate. This certificate is valid for one calendar year to present to the Secretary of State personnel at the time of license renewal.

Licensing agencies can encourage participation in training programs by including information about courses and promoting the positive benefits of attending courses through the mail when renewal notices are sent. Those states which require in-person license renewal could inform older drivers of training opportunities, provided license examiners had a list of available training programs for older adults and phone numbers of contact persons who could provide course information.

Another method of encouraging participation in training programs is to include course information with letters sent to drivers, who have a record of persistent traffic violations, requesting they come in for reexamination. Some licensing agencies have specially trained driver improvement counselors or analysts who meet individually or in small groups with drivers who have repeated convictions and assist them in identifying training programs or driving alternatives. Oregon's "Re-

Examination Evaluation Program" accepts drivers whose driving qualifications are in question. Upon referral by letter, a private meeting is scheduled with a specially trained counselor who compassionately (1) checks the person's medical history and medications; (2) gives a simple reflex test, a simple test for dementia, an oral examination on traffic rules and regulations, and a special vision test; and (3) gives a driving skills assessment ride. The counselor then makes recommendations for further tests and informs the examined driver of the areas in which improvements are needed and strategies for taking tests in the future.

A different option from the one chosen by Oregon is to make training a condition of license retention for everyone. This requires legislation, which states are often reluctant to pass.

One characteristic of older drivers that tends to be an obstacle to their participation in training programs is their reluctance to admit that their driving has become deficient. Licensing agencies could distribute self-evaluation checklists designed to help older drivers assess their own skills and pave the way for improvement.

In addition to self-evaluation and driver records, personal observation during the examination process can be used to identify problem drivers. Licensing agencies which have adequate manpower and expertise can have examiners assess functional impairment through license renewal, but periodic in-person renewal for all drivers would be necessary. Special training to equip examiners with skills needed to accurately identify persons with conditions leading to unsafe driving would be necessary.

Reexamination of older drivers occurs in response to complaints from members of the driver's family and reports from courts, police, insurance companies, and physicians. Licensing agencies can also identify problem drivers when they receive requests from public assistance agencies to review driving qualifications of older drivers who show signs of declining skills. Although the reexamination may result in a written or road test, or both, it could also take the form of an instruction program.

Licensing agencies that refer older drivers for training can certify or approve courses for voluntary enrollment, insurance discount, or license renewal or reinstatement or develop their own training programs to help drivers prepare for reexamination such as in the case of Oregon. A licensing agency who certifies courses would need to (1) learn what courses designed to meet the needs of older adults are available; (2) examine the curriculum and delivery methods, such as scheduling, handouts, and in-car versus classroom instruction, for each course; and (3) sit through each course to be able to recommend or approve a particular course. Those who certify courses need expertise in curriculum development, delivery, gerontology, and subject matter. If a licensing agency lacks this expertise, an outside consultant can be asked to review and make recommendations to the licensing agency. A program which is well run and well designed can be approved and older drivers can be referred to the program.

If a training program for older drivers has some weaknesses or is not tailored specifically to older drivers' learning patterns, the licensing agency or consultant should point out the necessary changes to the program developer and request a revision. When modifications are made, the program is approved for referral.

Licensing agencies that develop their own training programs encounter advantages and disadvantages. The advantages to this alternative are uniformity and control. The disadvantages are time, cost, and special qualifications needed to develop a course, train instructors or counselors, conduct the program, and evaluate the program.

Regardless of whether an existing, modified, or newly developed course is approved, licensing agencies should require the course to have performance standards and ways to measure the performance. Cognitive performance can be measured by written or oral exams. Driving performance can be measured through driving simulators with feedback provided to drivers through performance printouts. Behind-the-wheel performance can be assessed through driving skills road tests. These road tests should relate to the licensing agency's road test. Personnel can review the results of both the driving simulator and road test with participants, pointing out safety tips to remember when on the road.

One final step that can be taken by licensing agencies in educating older adults is to develop a comprehensive mailing list, focusing on an older adult clientele. This list would offer the ability to quickly and efficiently notify the older driver population of information, such as changes in the law and training programs available to older drivers.

In conclusion, training programs to improve driving skills are needed to reduce the vulnerability of older drivers to traffic accidents and preserve their independent mobility. Efforts by licensing agencies should be undertaken to (1) identify those older drivers whose deficiencies can be remedied through training, (2) encourage greater numbers of older drivers to participate in training programs, and (3) certify or develop courses for voluntary enrollment, insurance discount, or licensing action. A survey to identify the training programs to improve driving skills in each state should be undertaken to determine what is available for older drivers and identify aspects which lead to the success of the programs.

SUPPORT PROCESSESS

The various processes that have been described will not occur without a set of processes to support them. Changes in the way these support processes are carried on must precede improvements elsewhere. The support processes include:

- Selection and Training of Licensing Personnel;
- Identification and Referral of Deficient Drivers by Enforcement Personnel;
- Physician Reporting; and
- Functioning of Medical Advisory Boards.

SELECTION AND TRAINING OF LICENSING PERSONNEL

Douglas K. Tobin

As the transportation system ages, so does its component parts. The maturation of vehicles, roadways and humans creates unique concerns for highway safety professionals. Special efforts are commonly undertaken to repair deteriorated roadways and to design vehicles that better accommodate the highway transportation system. Periodically, the human factor may also require intervention and re-education to maintain the integrity and safety of the system.

Problem

The initial selection process for driver license personnel, in particular those charged with examination and counseling of driver license applicants, largely falls beyond the purview of driver license administrators. The choice of the appropriate individual may be governed by the rules of each State's civil service system or other system for State hiring. Where such positions are governed by selection based on years of service or other seniority provisions, choice of candidates can be even more limited.

Therefore, the major question facing driver license administrators is the training of the appropriate staff. Virtually all agencies have a training program for this staff whether on the job or a more formal program of classroom training. Furthermore, the American Association of Motor Vehicle Administrators (AAMVA) has established a Certified Driver Examiner (CDE) program to professionalize this job function in the United States and Canada. Thus, there exists a basic platform from which to build a specific component, namely training for the examination and counseling of the older driver.

Licensing agencies will see this issue as broader than elderly drivers. Much if not all of the components in this program will also address issues raised by all drivers with special needs. Thus, the issue becomes less one of age and one more of condition. The Americans with Disabilities Act (ADA) will require licensing agencies to make a much broader range of accommodations for all classes of individuals with physical and mental disabilities.

However, there exists as yet no national model elderly driver program for which a training program can be developed although there exists sever State developed model older driver programs, Oregon's being the best known. AAMVA is currently working on a model screening and evaluation program as well as a national non-commercial test that States could adopt similar to the commercial driver tests.

Needs

1. *Development of an elderly/special needs driver program.* The most basic need is for a program or programs that can be applied by all jurisdictions in dealing with the many issues involving the elderly driver. In order to be successful, the program must meet the three E's test. The program must be effective in either improving the mobility of the elderly and/or provide for the safety of other road users. It must be efficient by building on what currently exists either programmatically or with respect to infrastructure. Lastly, and often most importantly, it has to be economical. Many excellent road safety programs have foundered on this rock before.

2. *Development of a screening and evaluation tool or tool set.* Any program developed to deal with the special needs of the elderly will need a screening component in order to allow the target of scarce resources.

3. *Development of a range of responses.* A successful screening program will tell examiners the capabilities of the elderly driver in front of them. There needs to be an array of options for the examiner to select from whether full licensure, limited licensing, specific training or connection with a social service agency for the aging. One of the options should bee AAMVA's non-commercial driver skill test when it is completed.

Actions

1. *Develop a strategic training plan.* Any training program in this area is not a one time venture. Besides, determing the "what" or subject matter, the "when" or time must also be considered. How often the iterative training cycle needs to be should not be based strictly on budgetary considerations. All jurisdictions have training plans for their driver licensing staffs. This training needs to be fitted into those plans.

2. *Focus on the customer service aspects of the older driver.* Many jurisdictions have been focusing much of their training on the needs of their customers. The same techniques should be applied to the special needs of the elderly driver. There is probably no good way to inform someone their driving days are over, but there are certainly many bad ways to do so. In order to improve the delivery of the options for the older driver, training should be focused on how a staff member handle that interaction with the driver and the driver's family.

3. *Develop partnerships.* A licensing agency should never assume that it and it alone deals with the older driver. Whatever screening tools are used will probably require training beyond that available from the agency staff. Several States use specialists from sources such as rehabilitation hospitals to train their staffs in areas dealing with drivers with special needs. This practice will no doubt expand in the future.

4. *Evaluate the training program as well as the older driver program.* Aside from the routine administrative evaluation of the training course itself, States need to evaluate the effectiveness of their staff's interaction with the elderly driver and the results from that interaction.

IMPROVING THE ABILITY OF LAW ENFORCEMENT TO IDENTIFY AND REFER DEFICIENT DRIVERS

Raymond D. Cotton

Law enforcement has traditionally been assigned the critical role of removing deficient drivers from the roadways. As the population ages, special measures will be necessary to ensure the safety and mobility of older drivers. Current research identifies law enforcement as the single largest source for referring deficient drivers to licensing agencies. This should not seem that unusual because law enforcement personnel make thousands of driver contacts daily. During these contacts they are provided with a much greater opportunity to identify deficient driving behavior, as it occurs, than are other support functions.

Problem

Even though law enforcement personnel routinely observe deficient driving behavior, they often are unable to recognize drivers with cognitive or physical disabilities who should be referred for re-examination. Furthermore, in instances when deficiencies are detected, many law enforcement officers are ill-equipped, trained, or unable to process the referral.
The future challenge for law enforcement will be to better identify deficient drivers (this may include drivers with cognitive or physical disabilities) and establish procedures for referral of these drivers to the appropriate authorities for re-evaluation and/or re-examination.

One of the greatest challenges facing law enforcement, pertaining to the aging driver population, will be the detection of behavior that may be indicative of drivers using prescription drugs. The pervasive use of prescription drugs, and because the older population may have difficulty remembering when they've taken medications, may lead to more "drug impaired" drivers. The potentiating affect of multiple medications will further diminish the older driver's ability to perform driving tasks. Additionally, this population may share their medications with other drivers. Law enforcement should be prepared to curb the proliferation and abuse of these medications in their efforts to increase highway/public safety.

Most law enforcement agencies are balancing their resources between the war on crime and highway safety. Priorities are often established by community leaders and special interest groups. Unfortunately, highway safety (removing deficient drivers) does not always remain a priority for law enforcement when budgets are compromised. Although important, only a small portion of an officer's daily responsibilities can go to detecting and removing deficient drivers.

Needs

There are at least five (5) needs that should be met before law enforcement can improve its ability to detect and refer deficient drivers:

- *Research* Law enforcement must assess today's "state of the practice" in terms of policies, procedures, training, etc. for detecting and referring deficient drivers for re-examination.
- *Respond* Law enforcement must establish a set of prioritized tasks with respect to developing policies,

procedures, training and enforcement strategies directed at detecting and referring deficient drivers.

- *Re-educate* In service and basic recruit training is necessary to provide information about the characteristics of deficient drivers and the process of detecting and referring such drivers.
- *Report* Law enforcement must increase the public's awareness by reporting the issues associated with deficient driver behavior. Assistance from the general public may be a useful component in creating a network for referrals.
- *Refer* Each agency must enforce current laws, regulations and policies pertaining to deficient drivers and refer both resident and non-resident drivers with incompetencies to the appropriate authorities in a fair and impartial manner.

Actions

Improving the ability of law enforcement to detect and refer deficient drivers will be no easy task. However, improvements can be made by simply assessing current organizational priorities and determining effective procedures.

Law enforcement's ability to conduct research and analyze data is usually limited and therefore must be augmented by a review of the current available research. Developing methods to detect deficient drivers, i. e. drunk and drugged drivers, older drivers, younger high risk drivers, drivers with cognitive and/or physical disabilities will not necessarily require additional resources, but can be integrated into routine police practices. Similar strategies have been successful when combining speed, safety belt, drunk driving and crime suppression enforcement (comprehensive enforcement) into a single program.

Improve Capability

Specific actions to improve law enforcement's ability to detect and refer deficient drivers should include but are not limited to the following:

- *Consult* Confer with researchers to develop a working list of deficient driver behaviors for identification purposes.
- *Review Referral Process* Organize a "state of the practice" review of driver referral processes and support functions.
- *Training* Provide instruction in Identification of deficient driving behavior such as the use of cues for detecting drunk drivers at night and alcohol impaired motorcycle operators.
- *Testing* Provide for identification of deficient drivers through the use of standardized field sobriety tests to detect driver's with perceptual, cognitive and psychomotor deficient drivers.
- *Sensitivity* Deal with deficient and older driver sensitivity issues to include inter-personal skills directed towards the needs of the elderly and disabled.
- *Referral* Develop a referral process to include the screening function, licensing practice, and support functions.
- *Drug Awareness* Acquaint officers with problems of prescription drug use, and the subsequent affect it has on highway/public safety.
- *Crash Investigation* Refine investigative procedures to include the detection of deficient drivers and increase the utilization of accident reports to refer drivers to licensing agencies.
- *Integration of Processes* Integrate Incorporate the referral process into routine patrol operations. As law enforcement increases referrals, licensing agencies will experience an influx with which they may not be prepared to case. Therefore, it becomes critical that licensing agencies have in place the technological and administrative capabilities to process such an increase before law enforcement begins the referral process.
- *Feedback* Once referral process is complete, timely feedback from the licensing agency to the officer initiating the referral is essential.
- *Network* Circulate new methods, procedures, regulations throughout the law enforcement community.
- *Institutionalize* Develop a national training program for law enforcement officers to improve their ability to identify and refer deficient drivers.

Utilize Technology

Develop a "state of the art" process utilizing available technology to facilitate the transfer of information between law enforcement and licensing agencies for the identification and referral of deficient drivers. Perhaps a bifurcated referral form could be developed that would permit the immediate referral of drivers who are so deficient they present an imminent risk to themselves or others. Drivers who do not present such a risk could be referred in a more routine manner. This would allow licensing agencies the ability to initiate immediate action to remove the most deficient drivers from the roadway.

Increase Enforcement

Enforce current statutes and utilize available referral forms. State violator compacts and reciprocal agreements should include the referral process.

Presently, law enforcement's ability to refer deficient drivers is limited to residents of their respective states. Quite often, law enforcement officers contact out of state deficient drivers that may be suitable for referral to the driver's state licensing agency. Furthermore, state accident report forms should include a referral block for investigators to facilitate action by licensing authorities.

Summary

In summary, law enforcement has often been criticized for not being pro-active when issues emerge that effect public safety. Therefore, *now* is the time for the law enforcement community to prepare for any adverse impact that the increase in the aging driver population may have on highway/public safety.

PHYSICIAN REPORTING

Anne Long Morris

It is critical for older adults to continue driving into their later years because participation in this activity of daily living (ADL) enables them to successfully meet basic survival needs, i.e., obtaining food, and medical and/or social services. Government and/or private services are increasingly provided at central locations making it necessary for older adult consumers to have access to a car or other means of transportation. In rural, suburban, and in some urban locales of the United States, the availability of alternative transportation services is inadequate.

Maintaining older adult independence, mobility, and driving safety are the key focus of interventions by approximately 600 nationally registered occupational therapy practitioners who are state-licensed driver educators and who serve as driver rehabilitation specialists in 200 hospitals across the United States (American Occupational Therapy Association, 1990). Client populations include persons of all ages with disabilities and for whom ADLs such as self-care, mobility at home and in the larger community, part- or full-time employment, and/or household management have become dramatically limited. Driving abilities are obviously closely tied to performance of these ADLs. A person's impairment or decline in functional performance will be signalled by his or her increasing dependence on others for performance of ADLs and can be caused by injury, diseases, or physical aging changes such as arthritis; slowed reaction time; decreased vision; reduced hearing; impaired memory and/or information-processing problems.

The National Institute on Aging expected the number of internists and family physicians certified in geriatric practice to reach approximately 6000 by 1992 (DHHS, 1987). In addition to these physicians, other practitioners in general medicine who regularly serve elderly patients view the physicians' roles to be identification of at-risk drivers via review of a patient's medical threats to safe driving, driving pattern, and actual need to drive for the survival purposes earlier described.

Physicians must also be aware of state regulations regarding medical conditions and driving, particularly reporting requirements. In view of the physician-reporting mandate, failure to report could lead to action against the physician's license and/or liability if the client is driving and involved in a crash. Additional research is sorely needed in order to determine the particular impact of age-related changes on driving abilities.

These disorders that are recognized by health care providers as increasing the risk of unsafe driving and that are common among older persons include heart, circulatory, and lung diseases; diabetes; neurologic disorders, such as Alzheimer's and cognitive impairment, Parkinson's, and stroke; multiple medications; arthritis; and alcohol abuse (Reuben, 1993). Therapists regularly treat clients with these disorders in the hospital, through home health programs or in certified outpatient rehabilitation facilities, and through private practice. In addition, therapists are seeing an increased demand from family caregivers for evaluation and retraining of older drivers because these caregivers are concerned about their elderly relative's safety on the roadways. Historically, health care providers have learned about the availability of driver rehabilitation services by word-of-mouth. Clearly, education of health and social services providers who treat older adults will need to increase as the number of older drivers escalates.

Therapists' evaluation efforts have two primary goals: to provide objective information for decision making by the client, the family, the state licensing agency, and/or the medical advisory board (MAB) regarding driver licensure; and or identification of factors indicating when training could minimize existing limitations. As demands for older-driver rehabilitation increase, occupational therapy training in older-driver rehabilitation will need to be augmented through continuing education coursework. The number of driver rehabilitation program settings that offer field practice will need to be increased and educational materials must be published to assist in the development of new sites.

Data from a national survey of occupational therapy driver rehabilitation programs were reported at the 1993 American Occupational Therapy Conference (Hunt

1993) . Analysis of results gathered from among the 80 responding programs shows that the evaluation process typically includes an interview that asks the clients' about their driving history. The major focus of testing will address the motor, cognitive, and sensory evaluation aspects of the predriving battery in order to determine both strengths and weaknesses.

Therapists' motor evaluation considers, among other things, the client's joint range of motion, overall muscle and hand grip strength, reflexes, reaction time, and hand dominance. Sensory evaluation seeks information about a client's abilities to receive and accurately process visual input from traffic situations. Cognitive evaluation gathers psychometric information and looks at the client's ability to organize and respond to traffic information, i.e., traffic rules, directions, ability to concentrate and attentiveness to changing driving situational information. Results from the first phase determine if exposure to on-the-road testing is feasible.

The second phase of the evaluation involves on-the-road driving performance observations. Some clinics also report using a computerized driver simulator in addition to or instead of on-the-road observation experiences. Among the limitations identified through this survey are that few validated instruments appear to be used by therapists and decision making appears to be based more on subjective data than objective measures (Hunt, 1993).

Problem

The state licensing agency or department of motor vehicles (DMV) is ultimately responsible for regulating driving privilege. However, these state agencies regularly rely upon physician reporting about those patients with medical conditions that could lead to unsafe driving behaviors. Additional input to DMVs is expected from physicians serving on medical advisory boards (MABs). Research by the Association for the Advancement of Automotive Medicine found that a wide variety of board formats existed in those 41 states with MABs (Petrucelli, 1990). At that time few MABs included occupational therapists or any rehabilitation specialists; therefore interest in functional performance as a measure of driving abilities would have received little attention.

Results from the Massachusetts's Registry of Motor Vehicles survey conducted by this article's co-author (Anapolle, 1992) found that DMV regulations included a broad spectrum of vaguely defined policies for physically and mentally impaired drivers, as well as older drivers. Functional performance measures were vaguely defined in state regulations and chronic disorders, earlier cited as likely to cause unsafe driving among elderly populations, were not consistently addressed. In descending order of prevalence, a number of states lacked specific policies for these conditions: cardiac (10); diabetes (9); neurologic disorders (8); and stroke (6). Every state did have a policy for epilepsy. There is a lack of adequate data and specific guidelines to help physicians make the critical decision about whether a patient can drive safely. Assessing older-driver competency in persons experiencing chronic disease as a result of injury and/or disability, requires functional assessment skills and techniques that are not usually part of the standard examination given by physicians.

Multiple tasks are involved in the complex activity of driving. Comprehensive assessment requires more time than that typically allocated by the average physician for routine examinations. Physicians readily admit that functional assessment is generally too time consuming. Common physical limitations of older drivers can include limited range of motion in the neck and shoulder; arthritic changes in the hand; an impaired or nonfunctional arm; lower-extremity impairment; or a lower-back syndrome. Of equal significance, there may also be visual deficits that are not identified by a simple visual acuity test and of equal concern, cognitive and or perceptual impairments that are not addressed. Rehabilitation research strongly suggests that driving competency may best be determined by inclusion of performance based measures.

Needs

Physicians are expected to provide guidance regarding identification of potentially unsafe driver behaviors. Improvement of physician reporting should occur with their recognition that functional assessment warrants inclusion in routine physical examinations. Recent physician focus groups indicated a hesitancy about including functional assessments in routine 15-minute Medicare visits by the older adult. Instead, physicians preferred to refer the patient to a driver rehabilitation specialist, i.e., an occupational therapy practitioner, who is state certified as a driver evaluator, for an in-depth evaluation.

Therapists provide functional and environmental ADL skills evaluation; predriving clinical assessment; and behind-the-wheel evaluation and instruction. Therapists' on-the-road testing is of sufficient duration to include observation of motor, sensory, and cognitive functioning. Interpretation of the findings of this comprehensive evaluation, discussion of driving concerns, and selection of intervention options with client and family members are important components of the OT intervention. This multidisciplinary approach (physician

and occupational therapist sharing information with staff at state licensing agencies) leads to more appropriate decision making because facts are drawn from functionally based performance measures of driving tasks.

It would be risky for physicians to recommend denial of a patient's driving privileges based solely on an office medical examination because the risk of personal and/or public safety are too great. Functional abilities are viewed as far more significant criteria for decision making. Cognitive/behavioral skills such as attention, visuospatial abilities, intact judgment, and impulse control directly influence driving behaviors and can best be assessed by therapists during on-the-road examination. With earlier rehabilitation intervention for impaired drivers, the crash statistics among cognitively intact drivers could be improved substantially.

Action

The increasing numbers of older drivers on American roadways can be expected to escalate the demand for improved physician reporting of the likelihood of unsafe driver behaviors caused by medical conditions. The following steps are critically needed for health providers to actively respond to changing demographic profiles.

1. Health and human services provider awareness of and education about available community geriatric rehabilitation resources must be augmented. Rehabilitation professionals are skilled in functional and environmental evaluations to extend independent living skills. These include driver assessment and training services for older adult clients.

2. Simultaneously, the focus of therapist education must be expanded in order to increase the total number of occupational therapy practitioners trained and experienced in driver rehabilitation; and to increase the number of occupational therapy clinics that offer driver rehabilitation services.

3. Results show that occupational therapy practitioner participation on state medical advisory boards, and older driver task forces, is an extremely influential physician education resource. AOTA will continue to distribute information to physicians to heighten awareness of available community geriatric rehabilitation services.

4. AOTA's brochure, "Able Driving is Safe Driving," has been widely distributed and continues to be available to heighten public awareness about occupational therapy driver retraining programs. AOTA has distributed hundreds of education packets to physicians to heighten their awareness of the geriatric rehabilitation services that are available.

5. Approximately 350 of the 400 members in the ADED are occupational therapists. Informal conversations with members indicate that increasing numbers regularly provide in service education to local DMV staff. ADED members must become increasingly aware of the ongoing need for strong educational ties with special-needs staff. Opportunities for ongoing dialogue allow therapists to update DMV staff about changing abilities of older adults as they strive to meet the needs of the licensing reexamination.

6. Demographic changes suggest that physicians will continue to see more older adults in their client populations, which will require improved physician reporting about the likelihood of unsafe driving behaviors due to medical conditions. physicians must be made more aware of driver rehabilitation programs if they are to provide information adequate to older adults and their family members about how to sustain or assist the older adult in maintaining personal independence in ADLs, including driving.

7. As an outgrowth of this increased demand, so too will there be a critical need for all current evaluators (i.e., DMV special-needs staff, occupational therapists, and driver educators) to annually receive continuing education and training to ensure that they remain current in the screening and/or evaluation tools used to assess visual performance, physical abilities, attentional skills, perceptual abilities, reaction time, and actual behind-the-wheel performance.

AOTA and ADED must continue to work together to ensure:

- Increased older driver rehabilitation training course availability;
- Availability of relevant literature to facilitate implementation of new older driver rehabilitation programs;
- Exploration of the potential for adding disabled driver assessment and training to therapist and therapy assistants pre-professional coursework, as well as development of continuing education courses; and
- Exploration of the realities of older driver assessment and training certification potential.

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FUNCTIONING OF MEDICAL ADVISORY BOARDS AND PHYSICIAN REPORTING

Jackie Anapolle

Good medical advice and guidance are key to fair licensing practices. Department of motor vehicles rely primarily on health professionals and specialists in rehabilitation hospitals for help in judging when an impairment becomes a hazard to driving. Traditionally, medical advisory boards (MAB) are recognized as a medical group, established either by law or by administrative authority, for the purpose of advising driver licensing agencies on the medical aspects of driver impairment in all the major medical specialties.

Problem

However, inadequate screening techniques to identify high risk drivers and the lack of transportation alternatives for those who can no longer drive has raised serious issues for licensing agencies and the medical community. This situation becomes more critical upon examining the current status of medical advisory boards. Their members may:

1. Be appointees without any motivation to accomplish tasks.
2. Have limited training with no orientation program.
3. Lack knowledge of how driving skills relate to impairments/aging process.
4. Fear repercussion from no liability protection in reporting system.
5. Have no updated functional or medical standards to make sound decisions.
6. Feel inadequate to provide policy making rules.

For most citizens, the "right" to drive is extremely important. Since the department of motor vehicles has the responsibility to identify potentially unsafe drivers, it is critical that licensing examiners, clerks in branch offices, and board members are adequately trained and knowledgeable to detect those impairments that may cause unreasonable risks on our roadways.

Since medical examinations for all driver applicants is not a practical alternative, drivers are examined when a medical complication seems apparent. Consequently, licensing personnel have been forced to make medical judgments. (39 states have medical advisory boards) All the major medical specialties are usually included. Some medical advisory boards help establish the standards for making licensing decisions. (37 boards help design medical review process) Other boards act in an advisory capacity to determine who should or should not be licensed. (33 boards hear individual cases)

Recent survey results revealed great variation in the range of activities that boards undertake; yet, questionable licensure decisions rely heavily on the examining physicians's medical report as part of the review process. Many states function with their designated membership almost non-functional with no scheduled meetings and only several active members. For example, perhaps, the board's acting chairman and/or ophthalmologist could be contacted by motor vehicle personnel for advice only on questionable cases to clarify the difficult decision-making task of identifying at risk drivers.

Needs

The latest survey results from the Association for the Advancement of Automotive Medicine and the Massachusetts Registry of Motor Vehicles provided information reveals needs relative to medical advisory board membership, function, and legal protection.

Membership

Membership is a "labor of love" and often a test of one's endurance. It is beneficial to incorporate a representative "mix" paying attention to the specific specialties, training, geographic locations within the state, nature of their practice either clinical or research, women, minorities, and finally, but most important, the

candidates interest and enthusiasm to serve as "volunteers" to take on an active role. This "mix" ensures a multi-disciplinary working group with broad representation.

For example, a 'model' board would perhaps allow for an expanded membership including 'alternates' and 'associates' to participate. The 'alternates' would be old board members who could vote when necessary. The associates would be new non-voting members who would either have interest or would be involved in the field of traffic safety such as: allied health professionals (occupational therapists, emergency medical nurses), non-physicians (neuropsychologists, legal counsel), driver educators, and elder and/or disabled advocates.

An ideal situation would be to have the state medical society's committee on automotive safety, or some of its members, serve on the board. This would give the MAB access to information and expertise in the entire field of automotive safety and would allow an active board to broaden its objectives. It would also provide a direct route to the medical profession; enhance the board's stature. This perspective would insure broad-based cooperation within the MAB program, but most important would give recognition to the preventive aspects of automotive medicine.

Another key member, a public health physician, well trained in epidemiology would add depth and expertise to the board for research in the medical evaluation program as related to traffic safety.

Function

The key function was advisory to the motor vehicle commissioner on all medical aspects related to driver licensure. However, many boards are revising their criteria by developing new functional abilities guidelines to help physicians and branch clerks to make fair licensing decisions in identifying those individuals with potentially serious driver impairments. With proper standards to screen applicants, the board will not only be able to evaluate those referred but will also have the time for other activities as well.

The MAB can become involved in the training of licensing examiners to recognize signs and symptoms of driver impairment. This would reduce the number of board referrals as well as help educate other groups of individuals involved in the licensing process and help raise overall professionalism of the system. These examiners or driver improvement counselors would then have the knowledge to make better licensing decisions on specific questionable cases.

The MAB can develop the medical forms for the physicians who evaluate individual applicants. Forms need to be simple and concise in format and returned directly to the board or physician who works with the licensing agency rather than the examiner.

The MAB can be useful in creating an awareness for the medical profession concerning the role of driver impairment. Besides their advisory function, boards should spend time in orienting the profession concerning the medical aspects of driver licensing and the role physicians can take. Boards need to be involved with issues of physician reporting of driver impairment, wearers of telescopic lenses, safety belt, air bags, and helmet usage, as well as any scientific background in controversial areas. The board can work through the state medical association's newsletters, journals, and media to reach the community. Its members can give seminars to students at various medical and allied health professional colleges on the importance of medical impairment in crash causation and their future involvement in state MAB and traffic safety.

The MAB can spend time in developing educational approaches and materials for the general public to make it more aware of the implications of driver impairment and to encourage impaired individuals to seek medical help. When applicants are evaluated in person, the board has an excellent opportunity to discuss with the individual the extent of the impairment and what can be done. Activities such as these in which an individual is made to feel that personal safety and welfare are important would go a long way in establishing public support of MAB operations.

Legal protection

The protection of the members will only enhance the effectiveness of the board participants. The law should include that information received in connection with evaluating individuals for licensure is for confidential use of the board and/or department and can not be divulged or used as evidence in any court transaction, except as provided by law: directly related to suspension, restriction, or denial of a driver's license. Fear can have a direct bearing upon how effective an MAB can operate. It is essential that a clause to hold board members immune is included in the organizational papers.

Assuring confidentiality of information concerning reports received or made by medical advisory boards is an important issue, but it does not seem to present a major problem for licensing agencies even when this is not specifically addressed in the statute. When it is in the law, it states that information received in connection with evaluating individuals for licensure is for the confidential use of the board and/or department and cannot be divulged or used as evidence in any court

transactions except as provided by other sections of the law, in transactions directly related to suspension, restriction, or denial of a driver's license.

Board Operation

A national committee to develop uniform standards for medical advisory boards to use as a structured criteria is vital. Board members should be trained from these standards by experts in the driving field including specialists in vision; cognitive, physical, psychological, motor assessment; pharmacological effects of medications; reaction time; information processing especially those involving complex tasks, and knowledge of rehabilitative/adaptive techniques as they relate to specific medical disorders and conditions.

A team approach of allied health professionals, physicians, non-physicians, driving educators, legal counsel, disabled and/or elder advocates should all work together with sensitivity toward the multiple issues to balance prolonged independence and mobility for our driving population within a safe roadway environment. Whether medically, drug, or alcohol related, or just normal deterioration of skills, the team must be responsible to make fair and equitable decisions.

Action

The following action is needed to meet the needs that have been described:

1. The American Medical Association and other professional organizations must provide information to its members on the assessment of driver functional ability related to various medical conditions and/or diseases. These organizations should stress the importance of serving on department of motor vehicles' medical advisory boards to become informed decision makers. Improved coordination and exchange of information among these different professional groups will promote better 'working relationships' that should result in developing the most definitive and effective evaluation techniques.

2. Advanced educational curriculum should train *physicians*: (i.e. — internists, ophthalmologists, physical medicine therapists, geriatricians, neurologists, etc.), optometrists, psychologists, social workers, occupational therapists, and law enforcement officials a) to identify those "at risk patients" with acceptable versus non-acceptable functional levels that allow or hinder safe driving ability. b) to test and refer to the appropriate professional specialties for more comprehensive evaluation/review. c) to interpret findings to assess driving risk and licensure decisions.

3. All specialty professional organizations involved with medical advisory boards must continually educate its membership through newsletters, journals, seminar,s workshops, etc., to keep current on any new research developments in the area of driving, medical conditions, and functional status to be the informed leaders to the media.