

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 Capabilities;
- Medical Evaluation;
- Vision Screening; and
- Use of Traffic Records.

SCREENING FOR DRIVING PERFORMANCE

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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 physician'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

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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.