Advising older drivers or their families on the ability to drive safely is a challenge for physicians caring for older patients. The safety needs of the driver and others on the road must be balanced with needs for independence in transportation. Reporting laws vary by state, older driver research can be conflicting, and physicians are rarely trained in this area. We present some guidelines to assist physicians in this endeavor.

There are many good articles that discuss the general approach to evaluating older drivers, and review the major issues for driving safety. This article focuses on specific recommendations as to who should be referred for comprehensive older driver evaluation (visit www.driver-ed.org to see if a program is available in your area), and how to interpret the results obtained from such a program.

Safety-risk continuum
No test or evaluation program can accurately predict which individuals will or will not be involved in a motor vehicle accident. Driving researchers and groups, such as the National Highway Traffic Safety Administration (NHTSA), have been working to develop brief screening tests that can be done realistically in physicians offices to effectively identify individuals at high or low risk. More recently, NHTSA has focused less on identifying unsafe drivers, possibly related to problems inherent in having only two outcomes of testing (safe/unsafe), and more on optimizing drivers, vehicles, and driving environments.

At best, one can assign a likelihood or risk of future driving problems, which will, of necessity, be on a continuum from near zero risk to near complete risk. It should be clear, therefore, that no one cutpoint on this continuum can effectively divide those tested into two groups: quite safe or high risk.

Our protocol, as outlined in the figure, endeavors to classify evaluated drivers into multiple groups:

- Some individuals have temporary deficiencies, such as people who are recently post-stroke or head injury.
- Some individuals have remedial deficiencies, which can be improved/corrected with driver training, car modifications, use of a co-pilot or limitation of driving privileges (e.g., daylight only).
- Some individuals will be classified as fairly safe and require no further evaluation.
- Some individuals will be evaluated as unsafe, and driving suspension should be recommended.
- Some individuals will have unclear findings and require future evaluation.

Correlations with increased risk
Several characteristics have been shown to correlate with significantly increased crash/fatality risk or decreased driving ability in older adults. These include:

- age over 85
- dementia and
- visual impairment.

In addition, individuals with acute neurologic disease, such as stroke or head injury, need to have driving evalu-
uations before being considered safe on the road. Beyond these, evidence is lacking.

We would argue that individuals with a diagnosis of ongoing alcohol abuse, a personal history of one or more at-fault accidents, or who present with any driving concerns experienced by themselves or others, including their physicians, should undergo some degree of driver evaluation. Whereas some states mandate reporting driving concerns and the American Medical Association’s code of ethics recommends reporting to motor vehicles departments concerns about a driver’s abilities, physicians must realize that there may be a liability risk for such reporting.

By and large, older drivers with none of these characteristics are at low risk and do not require further evaluation. This should not keep the physician from addressing general driving related concerns, such as interval since last seizure or medication effects. This initial approach is depicted in steps 1 through 3 in the figure.

**Vision testing**

States that require mandatory vision testing for license renewal have lower crash rates among elderly drivers than states without such testing. Simple visual acuity, however, does not correlate well enough with crash risk to be a useful screen in a physician’s office.

Most states set legal limits for measured formal visual fields and individuals who do not meet those limits cannot legally drive. Physicians who can test for this (requires Field of Vision equipment), or obtain valid results from an eye care professional, should recommend driving cessation in those who fail.

Alternatively, the Useful Field of Vision (UFOV) test can be performed by an eye care professional. Those who pass this test and otherwise have no driving risks are at low risk for vehicular crashes and need no further evaluation. Those who fail are at double the subsequent risk of vehicular crashes. However, even double the risk is not enough to recommend driving cessation, so these individuals should be referred for further evaluation, which might include formal visual fields by an ophthalmologist.

Cognitive testing studies in demented patients show that driving skills can be maintained early in the disease, but worsen with disease progression. Multiple studies have correlated the Mini-Mental State Exam (MMSE) scores with driving performance and demonstrated that individuals with an MMSE score less than 20 failed an on-the-road test; one study showed that the average MMSE at the time of a first crash in Alzheimer’s patients was 19.9. Given this data, it seems reasonable to recommend driving cessation for all individuals with an MMSE < 20.

**When to refer:** Primary care physicians should be able to accomplish steps 1 through 4, sometimes even through step 5 in the protocol. Individuals not classified as either low or high risk through step 5 should undergo further testing and will usually need to be referred to a driver evaluation program.
Assessing older drivers

Figure Protocol to evaluate older (>65 years) drivers

- Patient, relative, physician or other individual or agency suggests the need for a driving evaluation
- Patient has a history of alcohol abuse, or suspected dementia
- Patient has a recent stroke or head injury
- Patient has a crash history

1. Is patient over age 85?
   - Yes
   - No

   2. Patient has suspected visual impairment
      - Yes
      - No

      3. UFOV test or formal visual fields
         - Passes
         - Fails

         Passes or N/A

         4. Perform MMSE
            - ≥20
            - <20

         5. Perform formal visual field testing if available and not already done
            - Passes or N/A

         6. Further evaluation
            - Simulator
            - On-the-road test

            Passes
            Fails

            Driving Evaluation Program

            UNCLEAR RISK
            Evaluate routinely?

LOW RISK
No further evaluation

HIGH RISK
Recommend cease driving

UNCLEAR RISK

UFOV - Use field of view
MMSE - Mini mental state exam
* If any of the following are available perform and separate into high risk groups (fails) and all
Source: Created for Geriatrics by RA Murden and K Unroe.

Driver evaluation programs
The following types of programs exist for further testing:

1) Driving simulators. The newer machines are elaborate and technically sound, but still provide an artificial environment. Poor driving simulator performance (worst 10%) is associated with a crash risk 8 times that of the best performances, and indicates a high enough risk that driving cessation is indicated. Other correlations between driving simulators and road tests or crashes are neither strong enough nor consistent enough to make any other recommendation from simulator tests, and no other inferences should be made.

2) On-the-road testing. This should be done by specialists (typically occupational therapists) in older drivers. Such testing should focus on the types of problems encountered by older drivers, including:
   - decreased reaction time
   - decreased speed of turning
   - trouble judging velocity of oncoming cars, and
   - decreased visual scanning and attention.

Actions such as backing out of a driveway or making left turns at busy intersections help evaluate these issues. On-the-road evaluations must include this type of modified testing in order to be useful in deciding the safety of an older driver.
If an older driver fails such testing, he or she should be strongly encouraged to refrain from driving. On the other hand, passing such a test does not guarantee that a driver otherwise at increased risk is safe. No good studies have correlated passing such tests with significantly decreased risks in otherwise high-risk groups. Those with other risks who pass this testing should be re-evaluated in the future at 1- to 2-year intervals.

3) Older driver evaluation programs include simple tests that can be done in physician offices, such as trail-marking or traffic sign recognition tests. They also may offer physiologic, visual and mental status testing, complex attention testing, driving simulators, on-the-road-tests, and more. Such programs often provide overall recommendations to continue or cease driving.

To date not one of these individual tests nor the gestalt impression by the driving team has demonstrated an ability to effectively distinguish safe from risky drivers. This may be largely because the research studies and driving programs do not strive to identify a clearly high-risk group, a clearly low risk group, and an intermediate group. When such distinctions have been made with a test or series of tests, the high-risk group has a crash risk about 8 times that of the lowest risk group,

This level of distinction (high risk group has a predicted crash risk about 8 times that of the lowest risk) is an appropriate goal for older driver evaluations. When programs do offer this distinction, the high-risk group should refrain from driving, and the particularly low-risk group need not be re-evaluated until circumstances change.

Conclusion
Older drivers identified as low risk by physicians using the protocol outlined here require no further evaluation unless circumstances change. For an individual identified as high risk, physicians should recommend that the patient cease driving immediately. Those whose office evaluations are unclear should be more fully evaluated and be scheduled for re-evaluations every 1 to 2 years unless/until they are identified definitely as low risk or high risk.

In addition, physicians need to recognize that this may be a difficult process for the older patient and should help prepare the older driver and his or her family. This would include discussion of alternate transportation methods, empathy concerning changes in independence, and focusing on the positive aspects of the process, such as improved safety for the driver and others. Drivers should also be informed when a physician will be notifying a motor vehicles department of driver safety concerns.

Using these strategies and the protocol should help physicians provide the best approach to issues of older driver safety.

References