Most older drivers are safe drivers and are less likely than younger people to drive recklessly, at high speeds, or under the influence of alcohol. However, motor vehicle injuries are the second leading cause of injury-related deaths among older adults. Very old adults (80 years and over) have higher rates of fatality and injury in motor vehicle crashes per million miles driven than any other age group except for teenagers. Therefore, consider safety screening of all very old drivers plus any older adult with certain high-risk medical conditions, including the following.

■ NEUROCOGNITIVE DISORDERS

Drivers with Alzheimer disease—the most common type of major neurocognitive disorder (dementia) in older adults in the United States—are at high risk for adverse driving events due to impaired memory, attentiveness, problem-solving skills, multitasking, orientation, judgment, and reaction speed. Even in amnesic mild cognitive impairment—a mild neurocognitive disorder without functional decline—driving skills such as lane control may be impaired.

Frontotemporal dementia, a less common cause of dementia in older adults, is associated with profound impairments in reasoning, task flexibility, planning, and execution. Persons with frontotemporal dementia are more likely to speed, run stop signs, and suffer more off-road crashes and collisions.

The diagnosis of dementia, however, is less predictive of driving risk than the stage of dementia. The American Academy of Neurology recommends that health care providers clinically “stage” all demented individuals using a validated tool at diagnosis and periodically afterwards. The Clinical Dementia Rating (CDR) scale is appropriate for staging dementia in the office. The CDR has also been shown to identify people with dementia who are at an increased risk of unsafe driving, with strong evidence (level of evidence A) relating dementia stage to driving risk. The CDR assigns a score of 1 for mild dementia (function impaired in at least one complex activity); 2 for moderate dementia (function impaired in at least one basic activity); and 3 for severe dementia. Individuals with a CDR score of 2 or higher are considered to be at very high risk if still driving. These persons should be encouraged to surrender their driving privileges. Even with mild dementia (CDR score of 1), as few as 41% of drivers may drive safely. Most persons with mild cognitive impairment (CDR score of 0.5) are safe drivers.

Patients often have poor insight into their driving safety. However, a caregiver’s rating of driving skills as marginal or unsafe is useful in identifying unsafe drivers (level of evidence B) and can be considered a red flag. Predictors with less support in the literature (level of evidence C) include recent traffic citations, motor vehicle accidents, and self-reported situational avoidance, such as limiting driving to familiar roadways. Additional predictors include Mini-Mental State Examination scores of 24 or less, and/or the emergence of...
an aggressive or impulsive personality (TABLE 1). A driver evaluation is helpful when there is mild cognitive impairment or mild dementia with at least one red flag.

Clinicians who are not comfortable with staging dementia as mild, moderate, or severe may consider referring to a neurologist or geriatrician.

There is no evidence to support or refute the benefit of interventional strategies such as driver rehabilitation for drivers with dementia.

**PARKINSON DISEASE**

Individually with mild motor disability from Parkinson disease may be fit drivers. As the disease progresses, drivers with Parkinson disease may make more errors than healthy elders in visual scanning, signaling, vehicle positioning, and velocity regulation (eg, traveling so slowly that it may be unsafe). Clinicians can consider referring a patient with Parkinson disease for a baseline driving evaluation upon diagnosis, and then every 1 to 2 years for reassessment. Alternate transportation should be arranged as the disease progresses.

**EPISODIC INCAPACITATION**

Approximately 1% to 3% of all motor vehicle accidents are due to sudden incapacitation of an otherwise safe driver.

**Syncope.** Neuroll mediated (vasovagal) syncope accounts for 30% to 35% of syncopal episodes while driving. Cardiac arrhythmias are the next most common cause and include bradyarrhythmias (7%), supraventricular tachyarrhythmias (2%–15%), and ventricular tachyarrhythmias (5%–17%). Because neurocardiogenic syncope often recurs, consider restricting driving for those with recurrent or severe neurocardiogenic syncopal episodes until symptoms are controlled.

**Arrhythmias.** Driving recommendations for various arrhythmias are listed in TABLE 2.

Many patients who have an implantable cardioverter-defibrillator (ICD) device experience an unexpected shock. For individuals with a history of ventricular tachycardia or fibrillation, the 5-year actuarial incidence of appropriate ICD shocks ranges between 55% and 70%. However, data indicate that 90% to 100% of drivers who received ICD discharges while driving continued to drive without causing motor vehicle accidents.

**Seizures.** States differ in their rules for reporting drivers who have epilepsy or breakthrough seizures. Physicians should refer to their state regulations when counseling these patients.

**POLYPHARMACY**

Polypharmacy is common in older adults. Many take psychoactive drugs that can impair tracking, alertness, coordination, and reaction time. With the “Roadwise Rx” tool (www.

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**TABLE 1**

Levels of evidence for predictive characteristics of unsafe drivers

<table>
<thead>
<tr>
<th>Level of evidence</th>
<th>Characteristic</th>
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<tbody>
<tr>
<td>A (predictive)</td>
<td>Clinical Dementia Rating score</td>
</tr>
<tr>
<td>B (probably predictive)</td>
<td>Caregiver’s rating of driving ability as marginal or unsafe</td>
</tr>
<tr>
<td>C (possibly predictive)</td>
<td>History of traffic citations or crashes, Reduced driving mileage, Self-reported situational avoidance, Mini-Mental State Examination score ≤ 24, Aggressive or impulsive personality</td>
</tr>
</tbody>
</table>

roadwiserx.com), health care providers and patients can enter the names of medicines to check if they affect driving ability. Nonproprietary on-line tools such as “START” (Screening Tool to Alert doctors to Right Treatment) and “STOPP” (Screening Tool of Older Persons’ Potentially Inappropriate Prescriptions) can be used to prune medication lists.

### DRIVING EVALUATION

America is a nation of highways overflowing with cars. Cars provide transportation but also reflect wealth and personality, particularly for men. Practically, the ability to drive a car allows older men and women to socialize in the community, shop for essentials, and take care of themselves without being a burden. Driving cessation can cause social isolation and depressive symptoms and can strain caregiver resources.

It is therefore understandable for health care providers to feel reluctant or uncomfortable counseling older adults to give up their driving privileges. A health care provider who identifies driving safety concerns can refer a patient to a geriatrician for further risk assessment or to a certified driver rehabilitation specialist (CDRS) for a driving evaluation.

### TABLE 2

<table>
<thead>
<tr>
<th>Arrhythmia</th>
<th>Treatment</th>
<th>Driving recommendations</th>
<th>Driving restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Symptomatic bradycardia</strong></td>
<td>Medical management, discontinue offending medicine</td>
<td>Can drive after successful treatment</td>
<td>Professional drivers</td>
</tr>
<tr>
<td></td>
<td>Pacemaker implantation</td>
<td>Can drive when pacemaker is functioning appropriately</td>
<td>Professional drivers</td>
</tr>
<tr>
<td><strong>Supraventricular tachyarrhythmia</strong></td>
<td>Medical treatment</td>
<td>Can drive after successful treatment</td>
<td>Pacemaker implantation</td>
</tr>
<tr>
<td></td>
<td>Catheter ablation</td>
<td>Can drive after establishing long-term success</td>
<td>Pacemaker implantation</td>
</tr>
<tr>
<td><strong>Ventricular arrhythmia</strong></td>
<td>Medical treatment</td>
<td>Can drive after successful treatment</td>
<td>Pacemaker implantation</td>
</tr>
<tr>
<td></td>
<td>Catheter ablation</td>
<td>Can drive after establishing long-term success</td>
<td>Pacemaker implantation</td>
</tr>
<tr>
<td></td>
<td>Implantable cardioverter-defibrillator (ICD) placement</td>
<td>Driving restricted for 4 weeks</td>
<td>Permanent restriction</td>
</tr>
<tr>
<td></td>
<td>Primary prevention</td>
<td>Driving restricted for 3 months</td>
<td>Permanent restriction</td>
</tr>
<tr>
<td></td>
<td>Secondary prevention</td>
<td>Driving restricted for 1 week</td>
<td>Permanent restriction</td>
</tr>
<tr>
<td></td>
<td>Replacement of ICD</td>
<td>Driving restricted for 4 weeks</td>
<td>Permanent restriction</td>
</tr>
<tr>
<td></td>
<td>Refusal of ICD</td>
<td>Driving restricted for 7 months</td>
<td>Permanent restriction</td>
</tr>
<tr>
<td></td>
<td>Primary prevention</td>
<td>No restriction</td>
<td>Permanent restriction</td>
</tr>
<tr>
<td></td>
<td>Secondary prevention</td>
<td>No restriction</td>
<td>Permanent restriction</td>
</tr>
</tbody>
</table>

KONCILJA AND COLLEAGUES

CDRS will also offer the patient and caregiver information on local resources for transportation alternatives. A list of local CDRSs can be found on the Association for Driver Rehabilitation Specialists website (www.aded.net). Many hospitals have occupational therapists who are CDRSs.

The evaluation typically involves an assessment of the driver’s knowledge of traffic signs and laws, a cognitive assessment, possibly a simulation, and finally an on-road driving evaluation if deemed appropriate. Medicare coverage depends on diagnosis and the state carrier.

REFERENCES


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