CHAPTER 1  THE OLDER ADULT DRIVER: AN OVERVIEW

Key Points

• The number of older adult drivers is growing rapidly, and they are driving longer distances.
• Motor vehicle crashes are far more harmful for older adults than for all other age groups.
• Driving cessation is inevitable for many and is often associated with negative outcomes.
• Many older adult drivers self-regulate their driving behavior.
• The risk of crashes for older drivers is in part related to physical, visual and/or mental changes associated with aging and/or disease.
• Clinical team members can help older adult drivers maintain safe driving skills using the Plan for Older Driver Safety (PODS) algorithm and may also influence older adult drivers’ decisions to modify or stop driving if they develop functional disability which affects driving skills.

Mrs. Alvarez, a 72-year-old woman with arthritis and hypertension, mentions during a routine appointment that she would like an earlier time slot so she can avoid heavy traffic and driving in the dark. She denies previous crashes or injuries but seems anxious about her planned two-day road trip to attend her grandson’s graduation. Mrs. Alvarez admits to feeling less confident when driving and has reduced her social and shopping activities because of her worries. How do you address these driving concerns?

Mr. Phillips, an 82-year-old man with a history of hypertension, congestive heart failure, atrial fibrillation, type 2 diabetes mellitus, macular degeneration, and osteoarthritis, comes to your office for a follow-up. You notice that Mr. Phillips has a great deal of trouble walking, uses a cane, and has difficulty reading his paperwork, even with his glasses. During your conversation, you ask him if he still drives, and he states that he takes short trips to run errands, get to appointments, and meet weekly with his bridge club. What are your next steps in addressing his fitness to drive?

Older adult drivers like Mrs. Alvarez and Mr. Phillips are encountered by clinical team members in every setting. The U.S. older adult population older than 65 reached 43 million in 2012 and is expected to double by 2050. Approximately 86% of Americans 65 and older continue to drive, with this cohort of 35 million older adult drivers comprising 16% of all licensed drivers in 2011. It is expected that one of every four licensed drivers will be an older adult by 2050, in addition to driving more miles than older drivers do today.

Common age-related changes that impact functional abilities in addition to medical conditions can make driving difficult, potentially reducing the older adult’s independence, social contact, and access to nutrition, health care, and other services. There are three clinical levels of care...
regarding driving ability in older adults (Table 1.1).

### Table 1.1   Clinical Levels of Care for Prevention of Driving Disability

<table>
<thead>
<tr>
<th>Level of Care</th>
<th>Description</th>
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<tbody>
<tr>
<td>Primary prevention</td>
<td>Assesses the older adult driver and intervenes to prevent the loss of driving ability</td>
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<tr>
<td>Secondary prevention</td>
<td>Addresses issues that have already caused the loss of driving skills and attempts to restore those skills through treatment and rehabilitation</td>
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<tr>
<td>Tertiary prevention</td>
<td>Identifies when irreversible loss of driving skills has occurred and includes recommending alternatives to avoid harm to the older adult and others when driving is no longer an option</td>
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Assessing and managing potential driving disability can be challenging and time consuming, especially because it is often considered a personal rather than a clinical issue. Legal and ethical questions may also deter clinical team members from addressing driving ability in older adults. Yet as medical conditions arise and progress with advancing age, older adult drivers and their caregivers will increasingly turn to clinical team members for guidance on safe driving. The challenge is in balancing the safety of older adults against their transportation needs and the safety of society.

This guide is intended to help answer the following questions and, if necessary, help clinical team members counsel patients about driving cessation and alternative means of transportation.

- At what level of severity do medical conditions impair safe driving?
- What can be done to help older adults prolong their driving life expectancy (time behind the wheel)?

**Note:** The information in this guide is provided to assist clinical team members in evaluating the ability of older adults to safely operate motor vehicles as part of their everyday, personal activities. Evaluating the ability of older adults to operate commercial vehicles or to function as professional drivers involves more stringent criteria and is beyond the scope of this guide.

### Clinical Team Members and Their Roles

All clinical team members can help identify and counsel older adults who may be at risk of driving impairment. Clinical team members may have opportunities to interact with older adults in varied health care settings for screening and perhaps assessment or referral to another team member or specialist for further evaluation as needed. Although many health
Care professionals do not work directly with one another in the same setting, “virtual” teams often come together during the course of care for an individual older adult. Some of the skills and roles of potential clinical team members are described below to help identify opportunities for interprofessional collaboration and to maximize the available support for an older adult.

**Physician/Nurse Practitioner/Physician Assistant**

The patient’s primary care provider, who may be a physician, nurse practitioner, or physician assistant, performs the medical evaluation to determine if the older adult has any medical conditions that may affect his or her ability to drive safely. This medical assessment helps to direct further supportive interventions, referrals, and potential medical treatment. Older adults are often more likely to consider changes in their driving practices if their primary care providers discuss the importance of safety interventions.

**Nurse**

Nurses contribute to the medical assessment by monitoring basic vital signs and evaluating functional abilities, disease risk factors, medication adherence and adverse effects, personal health behaviors such as alcohol use, and health literacy. This information can be used to facilitate changes in the care plan and follow-through by the older adult and/or their caregivers. Home-health nurses and direct care personal assistants often have unique opportunities to closely observe, counsel, and support older adults at home in their day-to-day activities. A nurse may also serve as a case manager, health counselor, resource for the older adult and caregivers, and liaison with other clinical team members if older adults or their caregivers have health-related questions or concerns.

**Pharmacist**

Pharmacists perform a thorough medication history, including use of over-the-counter drugs; assess adherence to medication regimens; assess the potential for medications, adverse effects, or drug interactions to affect driving ability; and counsel older adults on these issues. Pharmacists may also make recommendations to the clinical team for optimal pharmacologic management of medical conditions that may impair driving, and for dosage adjustment, timing, or therapeutic substitution of medications that may have driving-impairing effects. Some pharmacists also directly manage the treatment of various medical conditions that may contribute to driving impairment.

**Occupational Therapist/Driving Rehabilitation Specialist**

Occupational therapists assess the older adult’s functional abilities and the visual, cognitive, perceptual, and physical capacities for those abilities. Occupational therapists provide interventions for identified impairments to support mobility in the environment, including driving, and may recommend strategies, therapies, and assistive devices for rehabilitation. Occupational therapists often seek additional training to become driving rehabilitation specialists.
specialists, who can perform expert special assessments and therapeutic interventions specifically regarding fitness to drive, including on-road testing.

**Social Worker**

Social workers assess the older adult’s well-being and transportation needs, evaluate the level of caregiver support available, and help access affordable training and transportation options. Social workers may also help identify resources to overcome barriers to changing driving patterns or eventual driving retirement (such as financial support or peer support groups).

Many tools for evaluating older adult drivers, mobility counseling, and discussing driving retirement have been developed in the United States and other countries over the past decade since the original development of the American Medical Association’s *Physician’s Guide to Assessing and Counseling Older Drivers*. However, in part because of the complexity of the issues involved in driving and the heterogeneity in the older adult population, there are still relatively few well-studied strategies that reliably predict driving outcomes for each individual. In this revision of the guide, the American Geriatrics Society is collaborating with the National Highway Traffic Safety Administration to offer recommendations, tools, and resources for the clinical team involved in the care of older adults, with corresponding modifications of the previously developed assessment algorithm and recommended tests, for use in multiple care settings as follows:

- A clinically based assessment of medical fitness to drive, presented in the algorithm *Plan for Older Drivers’ Safety* (PODS) (see below in this chapter).
- A toolbox of practical, office-based functional assessment tests for driving-related skills, the Clinical Assessment of Driving Related Skills (CADReS) (see Chapter 3). The clinical team can choose among these tests, depending on the outcomes of screening tests and the individual older adult’s abilities (see Chapter 2).
- Information to help navigate the legal and ethical issues regarding patient driving safety, including information on patient reporting, with a State-by-State list of licensing agency contact information, and additional resources for locating license renewal criteria and reporting laws and procedures (see Chapters 7 and 8).
- A reference listing of medical conditions and medications that may affect driving, with specific recommendations for each (see Chapter 9).
- Recommended Current Procedural Terminology (CPT) codes for assessment and counseling procedures (see Appendix A).
- Handouts for older adults and their caregivers that include a self-screening tool for driving safety, safe driving tips, driving alternatives, and a resource sheet for concerned caregivers (see Appendix B). Links for accessing recommended resources from reputable organizations are also provided.
Sample approaches in subsequent chapters for conversations about driving assessment, rehabilitation, restriction, and cessation.

Online access to the guide through the American Geriatrics Society’s portal of resources (www.GeriatricsCareOnline.org) and via NHTSA’s Older Drivers website (www.nhtsa.gov/Driving+Safety/Older+Drivers).

Key Facts About Older Adult Drivers

The number of older adult drivers is growing rapidly, and they are driving longer distances.

Life expectancy is at an all-time high\(^5\) and the older population is rapidly increasing. By the year 2050, the population of adults 65 and older will more than double to approximately 89 million, making up at least 20% of the total U.S. population.\(^6\) In many States, including Florida and California, the population of those older than 65 may reach 20% in this decade. The fastest growing segment of the population is the 80-and-older group, which is anticipated to increase to 8 to 10 million over the next 30 years. Similar trends are occurring globally, with the expected worldwide population people aged 60 years or over expected to reach 21% by 2050, when the number of older adults is projected to exceed the number of children for the first time.\(^7\)

In addition, the United States has become a highly mobile society, and older adults drive for volunteer activities and gainful employment, social and recreational needs, and cross-country travel. Recent studies suggest that older adults are driving more frequently, and transportation surveys reveal an increasing number of miles driven per year for each successive aging cohort.\(^3\)

Motor vehicle crashes are far more harmful for older adults than other age groups.

In 2012, there were 5,560 people 65 and older who were killed and 214,000 who were injured in motor vehicle crashes.\(^1\) Unintentional injuries are the seventh leading cause of death among older adults, and motor vehicle crashes are the second most common cause of injury after falls.\(^8,9\) Compared with other drivers, older adult drivers have a higher fatality rate per mile driven than any other age group except drivers younger than 25.\(^10\) On the basis of estimated annual travel, the fatality rate for drivers 85 and older is 9 times higher than the rate for drivers 25 to 69 years old.\(^11\) Older adult pedestrians are also more likely to be fatally injured at crosswalks than younger adults.\(^12\)

There is a disproportionately higher rate of poor outcomes in older adult drivers, due in part to chest and head injuries.\(^13\) There may be several reasons for this. First, some older adult drivers are considerably more fragile. For example, older adults have an increased incidence of osteoporosis, which can lead to fractures, and/or atherosclerosis of the aorta, which can predispose to aortic rupture with chest trauma from an airbag or steering wheel. Fragility begins to increase at ages 60 to 64 and increases steadily with advancing age.\(^14\) Other causes
may be ownership of an older fleet of cars that is less crashworthy and/or over representation of specific types of crashes such as left hand turns that increase vulnerability to injury. Better countermeasures in roadway construction and vehicle protection may be helping mitigate the risks of frailty with a gradual decrease in deaths per mile driven in the past decade.\textsuperscript{15} Vehicle protection for older adults may improve as future cohorts of aging drivers purchase newer vehicles with better design features (information available on the American Automobile Association website at \url{http://seniordriving.aaa.com/}).\textsuperscript{16}

\textbf{Driving cessation is inevitable for many and often associated with negative outcomes.}

Driving is essential for performing necessary chores and maintaining social connectedness, with the latter having strong correlates with mental and physical health.\textsuperscript{17} Many older adults continue to work past retirement age or engage in volunteer work or other organized activities. In most cases, driving is the preferred means of transportation. In some rural or suburban areas, driving is the only available means of transportation. Just as the driver’s license is a symbol of independence for adolescents, the ability to continue driving means independent transportation and access to resources for day-to-day life for older adults and is highly valued.\textsuperscript{18}

In a survey of 2,422 adults 50 and older, 86\% of participants reported that driving was their usual mode of transportation. Within this group, driving was the usual method of transportation for 85\% of participants 75 to 79 years old, for 78\% of participants 80 to 84 years old, and for 60\% of participants 85 and older.\textsuperscript{19} These data also indicate that the probability of losing the ability to drive increases with advanced age. It is estimated that the average man will have 6 years without the functional ability to drive a car, and the average woman will have 10 years.\textsuperscript{20} However, many older adults may overestimate their driving life expectancy, with more than half of drivers surveyed by the CDC reporting they would stop driving sometime in their 90s, and 1 in 10 reporting they would never stop driving.\textsuperscript{21} Given this outlook, it is likely that older adult drivers and caregivers will be unprepared to address issues related to driving cessation when that time comes. Clinicians should initiate planning discussions for driving cessation earlier on in the process, before it becomes an urgency in the clinician’s office.

Studies of driving cessation have noted increased social isolation, decreased out-of-home activities,\textsuperscript{21} and increased depressive symptoms.\textsuperscript{22} These outcomes have been well documented and represent some of the negative consequences of driving cessation. It is important for the clinical team be supportive in the face of what may be a devastating loss of independence, and to use available resources and professionals who can assist with transportation to allow older adults to maintain independence. These issues will be discussed in subsequent chapters.
Many older adult drivers self-regulate their driving behavior.

As drivers age, they may begin to feel limited by slower reaction times, chronic health problems, and effects of medications. Although transportation surveys over the years document that the current cohort of older adult drivers is driving farther, in later life many reduce their mileage or stop driving altogether. According to an analysis of the 2009 National Household Travel Survey, daily travel patterns for drivers 65 and older show more driving time, more miles driven, and more trips taken in 2009 than in 1990 with more than 75% of male drivers and 60% of female drivers older than 85 driving 5 or more days per week. Older drivers are more likely to wear seat belts and are less likely to drive at night, speed, tailgate, consume alcohol before driving, or engage in other risky behaviors. Data also suggest that older women are more likely to self-regulate than men.

Older drivers may reduce their mileage by eliminating long highway trips. However, local roads often have more hazards in the form of signs, signals, traffic congestion, and confusing intersections. Therefore, decreasing mileage may not always proportionately decrease driving risks. In fact, the “low-mileage” drivers (i.e., less than 3,000 miles per year) may actually be the group most “at risk.”

Despite all these self-regulating measures, motor vehicle crash and fatality rates per mile driven begin to increase significantly at age 70. On a case-by-case level, the risk of a crash depends on whether each individual driver’s decreased mileage and behavior modifications are sufficient to counterbalance any decline in driving ability. In some cases, decline may occur so insidiously (e.g., peripheral vision loss) that the older driver is not aware of it until he or she experiences a crash. In fact, a recent study indicated that some older adults do not restrict their driving despite having significant visual deficits. Reliance on driving as the only available means of transportation can result in an unfortunate choice between poor options. In the case of dementia, older adult drivers may lack the insight to realize they are unsafe to drive.

In a series of focus groups conducted with older adults who had stopped driving within the past 5 years, about 40% of the participants knew someone older than 65 who had problems with driving but was still behind the wheel. Clearly, some older drivers require outside assessment and interventions when it comes to driving safety. This is well recognized by older adults themselves, with more than 7 in 10 of 1,700 adults 65 and older surveyed supporting both mandating in-person license renewals and medical screenings for drivers older than 75.

The risk of crashes for older drivers is in part related to physical, visual, and/or mental changes associated with aging and/or disease.

Compared with younger drivers whose car crashes are often due to inexperience or risky behaviors, crashes of older adult drivers tend to be related to inattention or slowed speed of visual processing. Crashes involving older adult drivers are often multiple-vehicle events.
that occur at intersections and involve left-hand turns. The crash is usually caused by the older driver’s failure to heed signs and grant the right-of-way, which may be related to difficulties judging the speed of other vehicles and the space available. At intersections with traffic signals, left-hand turns are a particular problem for older adult drivers. At stop-sign-controlled intersections, older adult drivers may not know when to turn.

These driving behaviors indicate that visual, cognitive, and/or motor factors may affect driving ability in older adults. Research has not yet determined what percentage of car crashes involving older adults are due to driving errors that are also common among middle-aged drivers, age-related changes in function (e.g., delayed reaction time), or age-related medical illnesses. However, it is believed that further improvements in traffic safety will likely result from improving driving performance or modifying driving behavior. The identification and management of medical conditions, functional impairments, and potentially driving-impairing medications may maintain or improve driving abilities and road safety.

**Clinical team members can influence older adult drivers’ decisions to modify or stop driving, as well as help older adult drivers maintain safe driving skills.**

Although older adult drivers believe they should be the ones to make the final decision about driving, they also agree that their primary care providers should advise them. In a series of focus groups conducted with older adults who had stopped driving, all agreed that clinicians should talk to older adults about driving, if a need exists. Although family advice had limited influence on the participants, most agreed if their physicians advised them to stop driving and their family concurred, they would certainly do so. This is consistent with a recent focus group study with caregivers of drivers with dementia, who stated that physicians should be involved in this important decision-making process. The clinical team together can provide the most complete information and advice for older adults and caregivers when arriving at decisions regarding driving.

In addition to helping determine ability to drive safely, the members of the clinical team can assist at-risk older adult drivers to maintain safe mobility in multiple ways, including recommending effective treatment and preventive health care measures, playing a role in determining the ability of older adults to drive safely, counseling older adults and caregivers, and helping access alternative transportation resources.

In many cases, clinical team members can help older adult drivers to stay on the road longer by identifying and managing medical conditions, such as cataracts and arthritis, or by discontinuing driving-impairing medications. Driving abilities share many attributes necessary for successful ambulation, such as adequate visual, cognitive, and motor function. In fact, a history of falls has been associated with an increased risk of motor vehicle crash. Clinical team members can reduce future risk of falls and fractures by advising on fall prevention and addressing certain extrinsic (environmental) and intrinsic factors.
There is an assumption that clinical team members can and do make a difference by evaluating older adults for their fitness to drive. However, there is a crucial need for systematic study of this hypothesis.\textsuperscript{39} Research and clinical reviews on the assessment of older adult drivers have focused on screening methods to identify unsafe drivers and restrict older drivers. Efforts to evaluate the efficacy of driving rehabilitation strategies have been recently reviewed and updated by the occupational therapy community,\textsuperscript{4} but other clinical interventions have not been similarly studied in the United States. Clinical team members are in positions to identify older adults at risk of unsafe driving or self-imposed driving cessation because of functional impairments, and to help address and manage these issues so that older adults can continue to drive safely for as long as possible.

The final determination of an individual’s ability to drive lies with the State licensing authority; however, clinical team members can assist with this determination. Driver licensing regulations and reporting laws vary greatly by State, and some State laws are vague and open to interpretation. Therefore, it is important for clinical team members to be aware of their State reporting laws and their responsibilities for reporting unsafe drivers to the local driver licensing authority. For more information on State laws, see Chapter 8.

Thus, clinical team members can play a more active role in preventing motor vehicle crashes by assessing and counseling older adult drivers regarding their fitness to drive, recommending safe driving practices, referring older adults to driver rehabilitation specialists, advising or recommending driving restrictions, and referring older adults to State licensing authorities when appropriate. To achieve these ends, clinical team members can follow the general principles below and recommendations in the algorithm \textit{Plan for Older Drivers’ Safety} (PODS) (see below in this chapter):

- **Screen** for red flags such as medical conditions, potentially driving-impairing medications, and recent adverse driving events or behaviors (see \textit{Am I a Safe Driver} and \textit{How to Help the Older Driver} in the appendices) (see Chapter 2).

- **Assess** driving-related functional skills in those older adults at increased risk of unsafe driving. For the toolbox of functional assessments, see the Clinical Assessment of Driving Related Skills (CADReS) in Chapter 3.

- **Evaluate and Treat** the at-risk older driver for medical conditions and other causes that may be impairing functional skills related to driving and intervene to:
  - **Optimize** the treatment of underlying medical and functional contributors to driving impairment within the clinical team member’s scope of practice or through to another clinical team member or medical subspecialist (see Chapter 4).
  - **Refer** older adult drivers with persistent deficits despite optimal medical treatment, when appropriate, to a driving rehabilitation specialist for further driving evaluation and/or training in use of adaptive equipment (see Chapter 5).
• At all times, discuss the maintenance of driving ability, safe driving behaviors, and driving restrictions. When appropriate, counsel older adults and their caregivers on potential driving cessation, and/or alternative transportation options as needed (see Chapter 6).

• Perform interval re-evaluations and follow-up with older adults who should adjust their driving to determine if they have made changes, and monitor those who stop driving for signs of depression and social isolation. Older driver abilities are not static and may either improve or decline as their conditions change. For example, an older adult may benefit from physical therapy after a stroke or surgery and regain functional abilities permitting them to return to driving. Older adults may therefore re-enter the PODS algorithm for reevaluation and/or treatment at any step along the way.

Although primary care providers may have access to the most resources to perform the PODS, other clinicians also have a responsibility to discuss driving with older adults. In addition, specialists in the fields of cardiology, ophthalmology, neurology, psychiatry, psychology, rehabilitation, orthopedics, emergency/urgent care, trauma, and others all encounter older adults with conditions that may have an impact on driving skills. When advising older adults, clinical team members may wish to consult the reference list of medical conditions in Chapter 9.
References


Plan for Older Drivers’ Safety (PODS)

**Step 1: Screening and Observation**
- Medical condition of concern?
- Symptoms on review of systems?
- Current/former driver? Wants to drive?
- Driving incidents or changes in the past 5 years?
- Older adult/caregiver concerns?

**At Risk: Positive Risk Factors Identified**

**Step 2: Use Clinical Assessment of Driving Related Skills (CADReS) to Identify Impairments and Seek Remediation**

- **General:** Driving History, IADLs, Questionnaire, Medication Change
- **Vision:** Fields, Acuity, Contrast
- **Cognitive:** MoCA, Trails B, Clock Drawing, Maze
- **Motor/Sensory:** Range of Motion, Proprioception, Get Up and Go, Rapid Pace Walk

**Step 3: Analysis of Screen and CADReS**

- **Not At Risk**
- **At Risk**

**Clinical Specialist Evaluation and Interventions**
- Medical Conditions
  - Uncompensated or In Recovery Phase
  - Optimized Remediation Needed: Refer to a Specialist

**Driving Rehabilitation Specialist Evaluation**
- Vehicle Adaptation/Training Needed: Refer to Available Resources

**Step 4: Driving Deficit Results**

- **Driving Deficit Identified**
  - No Significant Driving Deficit Identified: Fit To Drive
  - Discuss transportation plans and health maintenance
  - Fit to Drive with Restrictions: Perform Interval Re-evaluations

- **No Driving Yet:**
  - Refer for Recovery Plan to Revisit Driving
  - Repeat Step 3

**IADLs** Instrumental Activities of Daily Living
**MoCA** Montreal Cognitive Assessment

Pathway step may be repeated if progressive assessment necessary

* Clinical specialists may include medicine, nursing, rehabilitation, pharmacy, and social work, or others, depending on the clinical setting

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