

Clinician's Guide to Assessing and Counseling Older Drivers



3rd Edition



U.S. Department
of Transportation
**National Highway
Traffic Safety
Administration**

★★★★★
NHTSA
www.nhtsa.gov

Disclaimer

The project is supported by cooperative agreement number DTNH22-14-H-00454 from the National Highway Traffic Safety Administration of the U.S. Department of Transportation. The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of NHTSA or DOT. The United States Government assumes no liability for its content or use thereof. If trade or manufacturers' names or products are mentioned, it is because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Suggested APA Format Citation:

American Geriatrics Society & A. Pomidor, Ed. (2016, January). *Clinician's guide to assessing and counseling older drivers, 3rd edition*. (Report No. DOT HS 812 228). Washington, DC: National Highway Traffic Safety Administration. The American Geriatrics Society retains the copyright.

Clinician's Guide to Assessing and Counseling Older Drivers, 3rd Edition

An Update of the Physician's Guide to Assessing and Counseling Older Drivers

Table of Contents

Ch. #	Title	Page
-	Front Matter and Introduction	i
1	The Older Adult Driver: An Overview	1
2	Is the Older Adult at Increased Risk of Unsafe Driving?	16
3	Screening and Assessment of Functional Abilities for Driving	29
4	Clinical Interventions	52
5	The Driver Rehabilitation Specialist	66
6	Advising the Older Adult About Transitioning from Driving	79
7	Ethical and Legal Issues	95
8	State Licensing and Reporting Laws	114
9	Medical Conditions, Functional Deficits, and Medications That May Affect Driving Safety	126
10	Meeting Future Transportation Needs of Older Adults	190
App A	CPT Codes	206
App B	Patient and Caregiver Educational Material	210
	– Am I a Safe Driver?	212
	– Getting by Without Driving	214
	– How to Assist the Older Driver	218
	– NHTSA's How to Understand and Influence Older Drivers	222
	– Ten Tips to Aging Well	239
	– Tips for Safe Driving	240
App C	Clinical Team Resources	244
	– Clinical Assessment of Driving Related Skills (CADReS) Score Sheet	245
	– Evidence Table for Assessments (selected in Ch. 3)	248
	– Medical Review Board Sample Letter	252
	– Modified Driving Habits Questionnaire	253
	– Montreal Cognitive Assessment (MoCA) and Form	258
	– Motor Vehicle Adaptive Equipment Descriptions and NHTSA's Adapting Motor Vehicles for Older Drivers brochure	263
	– Sample Driving Cessation Plan	288
	– Snellen Chart	290
	– Snellgrove Maze Test and Form	292
	– Three Levels of Spectrum of Driver Services	295
	– Trails A Test	297
	– Trails B Test	298

Clinician's Guide to Assessing and Counseling Older Drivers, 3rd Edition
An Update of the Physician's Guide to Assessing and Counseling Older Drivers

COPYRIGHT

Except where authorized, no part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without prior written permission of the American Geriatrics Society, 40 Fulton Street, 18th Floor, New York, NY 10038. Please note that the authors of this guide strongly discourage changes to the content, as it has undergone rigorous, comprehensive review by medical specialists and other experts in the field of older driver safety.

The publication is produced under a cooperative agreement with the U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA). NHTSA is authorized to distribute the publication to the general public.

Although the Clinician's Guide to Assessing and Counseling Older Drivers, 3rd Edition, is distributed by various companies in the health care field, it is independently prepared. All decisions regarding its content are solely the responsibility of the authors. Their decisions are not subject to any form of approval by other interests or organizations.

The information in this guide is provided to assist health care providers in evaluating the ability of their older patients to operate motor vehicles safely as part of their everyday, personal activities. Evaluating the ability of patients to operate commercial vehicles or to function as professional drivers involves more stringent criteria and is beyond the scope of this publication.

This guide is not intended as a standard of medical care, nor should it be used as a substitute for health care provider's clinical judgment. Rather, this guide reflects the scientific literature and views of experts as of July 2015, and is provided for informational and educational purposes only. None of this guide's material should be construed as legal advice nor used to resolve legal problems. If legal advice is required, we urge you to consult an attorney who is licensed to practice in your State.

No responsibility is assumed by the authors or the American Geriatrics Society for any injury or damage to persons or property, as a matter of product liability, negligence, warranty, or otherwise, arising out of the use or application of any methods, products, instructions, or ideas contained herein. No guarantee, endorsement, or warranty of any kind, express or implied (including specifically no warrant of merchantability or of fitness for a particular purpose) is given by the Society in connection with any information contained herein. Independent verification of any diagnosis, treatment, or drug use or dosage should be obtained. No test or

procedure should be performed unless, in the judgment of an independent, qualified health care provider, it is justified in the light of the risk involved.

ACKNOWLEDGEMENTS

This edition of the Clinician's Guide to Assessing and Counseling Older Drivers is the product of a cooperative agreement between the American Geriatrics Society (AGS) and the National Highway Traffic Safety Administration (NHTSA), and is an update to the Physician's Guide to Assessing and Counseling Older Drivers that was originally developed by the American Medical Association (AMA) under a prior cooperative agreement with NHTSA.

EDITORIAL BOARD

EDITORIAL BOARD CHAIR

Alice Pomidor, MD, MPH, AGSF
Professor, Department of Geriatrics
Florida State University College of Medicine
Tallahassee, FL

EDITORIAL BOARD MEMBERS

Anne E. Dickerson, PhD, OTR/L, FAOTA
Department of Occupational Therapy
East Carolina University
Greenville, NC

Shelly Gray, PharmD, MS
Professor and Vice Chair for Curriculum and Instruction, Department of Pharmacy
Director, Geriatric Program and Plein Certificate
School of Pharmacy
Seattle, WA

Richard Marottoli, MD
Medical Director of the Dorothy Adler
Geriatric Assessment Center
Yale University
New Haven, CT

Irene Moore, MSSW, LISW-S, AGSF
Professor, Department of Family and Community Medicine
University of Cincinnati Geriatric Medicine Program
Cincinnati, OH

Barbara Resnick, PhD, RN, CRNP, FAAN, FAANP
Professor
University of Maryland
Baltimore, MD

Elin Schold-Davis, OTR/L, CDRS
Project Coordinator
AOTA Older Driver Initiative
Bethesda, MD

SUBJECT EXPERT ADVISORY PANEL

David B. Carr, MD
Alan A. and Edith L. Wolff Professor of Geriatric Medicine, and Professor of Neurology
Washington University School of Medicine
St. Louis, MO

Carl A. Soderstrom, MD
Adjunct Professor of Surgery at the University of Maryland School of Medicine
Senior Volunteer Staff Member of the school's National Study Center for Trauma and EMS
Chief of the Medical Advisory Board (MAB) of the Maryland Motor Vehicle Administration
Baltimore, MD

ORIGINAL CONTENT AUTHORS, CONSULTANTS, AND ADVISORY PANEL

FIRST EDITION: PRIMARY AUTHORS

Claire C. Wang, MD, American Medical Association
Catherine J. Kosinski, MSW, American Medical Association
Joanne G. Schwartzberg, MD, American Medical Association
Anne Shanklin, MA, American Medical Association

SECOND EDITION: PRINCIPAL FACULTY AUTHORS

Editor: David B. Carr, MD, Associate Professor of Medicine and Neurology
Washington University at St. Louis, Clinical Director

Planning Committee: David B. Carr, MD, Associate Professor of Medicine and Neurology
Washington University at St. Louis, Clinical Director

Joanne G. Schwartzberg, MD, Director, Aging and Community Health, American Medical Association

Lela Manning, MPH, MBA, Project Coordinator, American Medical Association

SECOND EDITION: CONTENT CONSULTANTS

Lori C. Cohen, AARP Senior Project Manager, Driver Safety
Jami Croston, OTD, Washington University at St. Louis

T. Bella Dinh-Zarr, PhD, MPH, Road Safety Director, FIA Foundation North American Director,
MAKE ROADS SAFE–The Campaign for Global Road Safety

John W. Eberhard, PhD, Consultant, Aging and Senior Transportation Issues

Camille Fitzpatrick, MSN, NP, University of California Irvine Clinical Professor Family Medicine

Mitchell A. Garber, MD, MPH, MSME, National Transportation Safety Board Medical Officer

Anne Hegberg, MS, OTR/L, Marionjoy Rehabilitation Hospital Certified Driver Rehabilitation
Specialist

Patti Y. Horsley, MPH, Center for Injury Prevention Policy and Practice SDSU EPIC Branch
California Department of Public Health

Linda Hunt, OTR/L, PhD, Pacific University School of Occupational Therapy Associate Professor

Jack Joyce, Maryland Motor Vehicle Administration Driver Safety Research Office Senior
Research Associate

Karin Kleinhans OTR/L, Sierra Nevada Memorial Hospital Center for Injury Prevention Policy &
Practice Occupational Therapy Association of California

Kathryn MacLean, MSW, St. Louis University

Mangadhara R. Madineedi, MD, MSA, Harvard Medical School Instructor in Medicine VA
Boston Healthcare System Director, Geriatrics & Extended Care Service Line

Richard Marottoli, MD, MPH, American Geriatrics Society

John C. Morris, Professor of Neurology Washington University School of Medicine

Germaine L. Odenheimer, MDVAMC, Donald W. Reynolds Department of Geriatric Medicine
Associate Professor

Alice Pomidor, MD, MPH, Florida State University College of Medicine
Associate Professor, Department of Geriatrics

Kanika Mehta Rankin, Loyola University Chicago School of Law (2nd year) Juris Doctorate
Candidate, 2011

Yael Raz, MD, American Academy of Otolaryngology

William H. Roccaforte, MD, American Association for Geriatric Psychiatry Nebraska Medical Center Department of Psychiatry

Gayle San Marco, OTR/L, CDRS, Northridge Hospital Medical Center Project Consultation, Center for Injury Prevention Policy & Practice

Freddi Segal-Gidan, PA-C, PhD, American Geriatrics Society

William Shea, OTR/L, Fairlawn Rehabilitation Hospital

Patricia E. Sokol, RN, JD, Senior Policy Analyst, Patient Safety American Medical Association

Esther Wagner, MA, National Highway Traffic Safety Administration

FIRST EDITION: ADVISORY PANEL

Sharon Allison-Ottey, MD, National Medical Association

Joseph D. Bloom, MD, American Psychiatric Association

Audrey Rhodes Boyd, MD, American Academy of Family Physicians

David B. Carr, MD, Washington University School of Medicine

Bonnie M. Dobbs, PhD, University of Alberta Association for the Advancement of Automotive Medicine

John Eberhard, PhD, National Highway Traffic Safety Administration

Laurie Flaherty, RN, MS, National Highway Traffic Safety Administration

Arthur M. Gershkoff, MD, American Academy of Physical Medicine and Rehabilitation

Brian Greenberg, MEd, American Association of Retired Persons

Lynne M. Kirk, MD, FACP, American College of Physicians – American Society of Internal Medicine

Marian C. Limacher, MD, FACC, FSGC, American College of Cardiology Society of Geriatric Cardiology

Richard Marottoli, MD, MPH, American Geriatrics Society

Lylas G. Mogk, MD, American Academy of Ophthalmology

John C. Morris, MD, American Academy of Neurology Alzheimer's Association

James O'Hanlon, PhD, Tri-Counties Regional Center

Cynthia Owsley, PhD, MSPH, University of Alabama at Birmingham

Robert Raleigh, MD, Maryland Department of Transportation

William Roccaforte, MD, American Association for Geriatric Psychiatry

Jose R. Santana Jr., MD, MPH, National Hispanic Medical Association

Melvyn L. Sterling, MD, FACP, Council on Scientific Affairs American Medical Association

Jane Stutts, PhD, University of North Carolina Highway Safety Research Center

FIRST EDITION: REVIEW COMMITTEE

Geri Adler, MSW, PhD, Minneapolis Geriatric Research Education Clinical Center

Reva Adler, MD, American Geriatrics Society

Elizabeth Alicandri, Federal Highway Administration

Paul J. Andreason, MD, Food and Drug Administration

Mike Bailey, Oklahoma Department of Public Safety

Robin Barr, PhD, National Institute on Aging

Arlene Bierman, MD, MS, Agency for Healthcare Research and Quality

Carol Bodenheimer, MD, American Academy of Physical Medicine and Rehabilitation

Jennifer Bottomley, PhD, MS, PT, American Physical Therapy Association

Thomas A. Cavalieri, DO, American Osteopathic Association

Lori Cohen, American Association of Motor Vehicle Administrators

Joseph Coughlin, PhD, Gerontological Society of America

T. Bella Dinh-Zarr, PhD, MPH, AAA

Barbara Du Bois, PhD, National Resources Center on Aging and Injury

Leonard Evans, PhD, Science Serving Society

Connie Evaschwick, ScD., FACHE, American Public Health Association

Jeff Finn, MA, American Occupational Therapy Association

Jaime Fitten, MD, UCLA School of Medicine

Marshall Flax, MA, Association for the Education and Rehabilitation of the Blind and Visually Impaired

Linda Ford, MD, Nebraska Medical Association

Barbara Freund, PhD, Eastern Virginia Medical School

Mitchell Garber, MD, MPH, MSME, National Transportation Safety Board

Andrea Gilbert, COTA/L, Rehabilitation Institute of Chicago

Claudia Grimm, MSW, Oregon Department of Transportation

Kent Higgins, PhD, Lighthouse International

Linda Hunt, PhD, OTR/L, Maryville University

Mary Janke, PhD, California Department of Motor Vehicles

Gary Kay, PhD, Washington Neuropsychological Institute

Shara Lynn Kelsey, Research and Development California Department of Motor Vehicles

Susan Kirinich, National Highway Traffic Safety Administration

Donald Kline, PhD, University of Calgary

Philip LePore, MS, New York State Office for the Aging

Sandra Lesikar, PhD, US Army Center for Health Promotion and Preventive Medicine

William Mann, OTR, PhD, University of Florida

Dennis McCarthy, MEd, OTR/L, University of Florida

Gerald McGwin, PhD, University of Alabama

Michael Mello, MD, FACEP, American College of Emergency Physicians

Barbara Messinger-Rapport, MD, PhD, Cleveland Clinic Foundation

Alison A. Moore, MD, MPH, David Geffen School of Medicine,
University of California

Anne Long Morris, EdD, OTR/L, American Society on Aging

Germaine Odenheimer, MD, Center for Assessment and Rehabilitation of Elderly Drivers

Eli Peli, M.Sc., OD, Schepens Eye Research Institute

Alice Pomidor, MD, MPH, Society of Teachers of Family Medicine

George Rebok, MA, PhD, Johns Hopkins School of Hygiene and Public Health

Selma Sauls, Florida Department of Highway Safety and Motor Vehicles

Susan Samson, Pinellas/Pasco Area Agency on Aging

Steven Schachter, MD, Epilepsy Foundation

Frank Schieber, PhD, University of South Dakota

Freddi Segal-Gidan, PA, PhD, American Geriatrics Society

Melvin Shipp, OD, MPH, DrPh, University of Alabama at Birmingham

Richard Sims, MD, American Geriatrics Society

Kristen Snyder, MD, Oregon Health & Science University School of Medicine

Susan Standfast, MD, MPH, American College of Preventative Medicine

Holly Stanley, MD, American Geriatrics Society

Loren Staplin, PhD, Transanalytics and Texas Transportation Institute

Wendy Stav, PhD, OTR, CDRS, American Occupational Therapy Association Cleveland State University

Donna Stressel, OTR, CDRS, Association of Driver Rehabilitation Specialists

Cathi A. Thomas, RN, MS, Boston University Medical Center American Parkinson Disease Association

John Tongue, MD, American Academy of Orthopedic Surgery

Patricia Waller, PhD, University of Michigan

Lisa Yagoda, MSW, ACSW, National Association of Social Workers

Patti Yanochko, MPH, San Diego State University

Richard Zorowitz, MD, National Stroke Association

DISCLOSURE OF FINANCIAL INTERESTS

As an accredited provider of Continuing Medical Education, the American Geriatrics Society continuously strives to ensure that the education activities planned and conducted by our faculty meet generally accepted ethical standards as codified by the ACCME, the Food and Drug Administration, and the American Medical Association's Guide for Gifts to Physicians. To this end, we have implemented a process wherein everyone who is in a position to control the content of an educational activity has disclosed to us all relevant financial relationships with any commercial interests within the past 12 months as related to the content of their presentations and under which we work to resolve any real or apparent conflicts of interest. Conflicts of interest in this particular CME activity have been resolved by having the presentation content independently peer reviewed before publication by the Editorial Board and Question Review Committee.

The following contributors have returned disclosure forms indicating that they (and/or their spouses/partners) have no affiliation with, or financial interest in, any commercial interest that may have direct interest in the subject matter of their chapters/questions:

David B. Carr, MD
Anne E. Dickerson, PhD, OTR/L, FAOTA
Shelly Gray, PharmD, MS
Richard Marottoli, MD
Irene Moore, MSSW, LISW-S, AGSF
Alice Pomidor, MD, MPH, AGSF
Barbara Resnick, PhD, RN, CRNP, FAAN, FAANP
Elin Schold-Davis, OTR/L, CDRS
Carl A. Soderstrom, MD

The following contributors (and/or their spouses/partners) have reported real or apparent conflicts of interest that have been resolved through a peer review content validation process:

Susan E. Aiello, DVM, ELS

Clinician's Guide to Assessing and Counseling Older Drivers, 3rd Edition

An Update of the Physician's Guide to Assessing and Counseling Older Drivers

Introduction

Translating research findings and public health initiatives into practical everyday applications for patient-centered care is a constant challenge for clinicians engaged in the care of older adults. Nearly everyone, regardless of profession or specialty, will be working with older adults as either patients or caregivers in the next 20 years as the baby boomer generation enters their retirement years living longer and being more active than any previous generation. As the most mobile generation to date, these older adults are already putting in more miles behind the wheel and expect to remain mobile in the community as they age, ideally with a driving “life expectancy” that keeps up with their lifespan.

In order to support older adults’ access to health care, social interaction, and nutrition through independent mobility, interprofessional clinical team members need office-based tools to screen for medical and functional issues which may affect driving ability, assess the risk of driving impairment, intervene to optimize treatment and functional ability, refer appropriately for specialized care and driving rehabilitation, and provide counseling about planning for transitioning from driving if necessary.

The American Geriatrics Society (AGS) entered into a cooperative agreement with the U . S . Department of Transportation’s National Highway Traffic Safety Administration (NHTSA) to update and expand the Physician’s Guide to Assessing and Counseling Older Drivers that was originally developed by the American Medical Association (AMA) under a prior cooperative agreement with NHTSA. The current title of the guide — *Clinician's Guide to Assessing and Counseling Older Drivers, 3rd Edition* — reflects the interprofessional nature of the team caring for an older adult driver.

The main goal of the guide remains helping health care practitioners prevent motor vehicle crashes and injury to older adults. Motor vehicle injuries persist as the leading cause of injury-related deaths among 65- to 74-year-olds and are the second leading cause (after falls) among 75- to 84-year-olds. While traffic safety programs have had partial success in reducing crash rates for all drivers, the fatality rate for drivers over 65 has consistently remained high.

Increased comorbidities and frailty associated with aging make it far more difficult to survive a crash, and the expected massive increase in the number of older adults on the road is certain to lead to increased injuries and deaths unless we can successfully intervene to prevent harm.

Health care practitioners caring for older adults are in a leading position to address and correct this public health concern at the individual patient and caregiver level. By providing effective health care, clinicians can help their patients maintain a high level of fitness, enabling them to preserve safe driving skills later in life and protecting them against serious injuries in the event of a crash. By adopting preventive practices—including the assessment and counseling

strategies outlined in this guide—clinicians can better identify older drivers at risk for crashes, help enhance their driving safety, and ease the transition to driving retirement if and when it becomes necessary.

We wish to especially thank Brian Chodrow at NHTSA for his guidance and support for this edition of the guide and Essie Wagner for her pioneering work with previous editions.

Our current interprofessional Editorial Board has taken great care to preserve the intent of providing the best evidence-based recommendations from the current literature, while recognizing the different environments of care in which members of the clinical team encounter older adults. We hope that you will find the guide useful and welcome your feedback as we move forward in engaging our older adults and caregivers in maintaining safe mobility for life.

The project is supported by cooperative agreement number DTNH22-14-H-00454 from the National Highway Traffic Safety Administration of the U.S. Department of Transportation. The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of NHTSA or DOT. The United States Government assumes no liability for its content or use thereof. If trade or manufacturers' names or products are mentioned, it is because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

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.^{1,2} 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.³

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

Level of Care	Description
Primary prevention	Assesses the older adult driver and intervenes to prevent the loss of driving ability
Secondary prevention	Addresses issues that have already caused the loss of driving skills and attempts to restore those skills through treatment and rehabilitation
Tertiary prevention	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

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.⁴

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, 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 high⁵ 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.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 <http://seniordriving.aaa.com/>).¹⁶

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.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.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.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.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.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,²¹ and increased depressive symptoms.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.²³ 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.²⁴ Data also suggest that older women are more likely to self-regulate than men.²⁵

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.²⁶ In fact, the “low-mileage” drivers (i.e., less than 3,000 miles per year) may actually be the group most “at risk.”²⁷

Despite all these self-regulating measures, motor vehicle crash and fatality rates per mile driven begin to increase significantly at age 70.¹⁰ 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.²⁸ 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.²⁹ 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 75.³

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,^{30,31} crashes of older adult drivers tend to be related to inattention or slowed speed of visual processing.³² Crashes involving older adult drivers are often multiple-vehicle events

that occur at intersections and involve left-hand turns.³³ 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.³³

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.³⁴ 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,³⁵ 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.^{29,36} 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.⁴ 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.³⁷ Clinical team members can reduce future risk of falls and fractures by advising on fall prevention and addressing certain extrinsic (environmental) and intrinsic factors.³⁸

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.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,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 *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 *Am I a Safe Driver* and *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

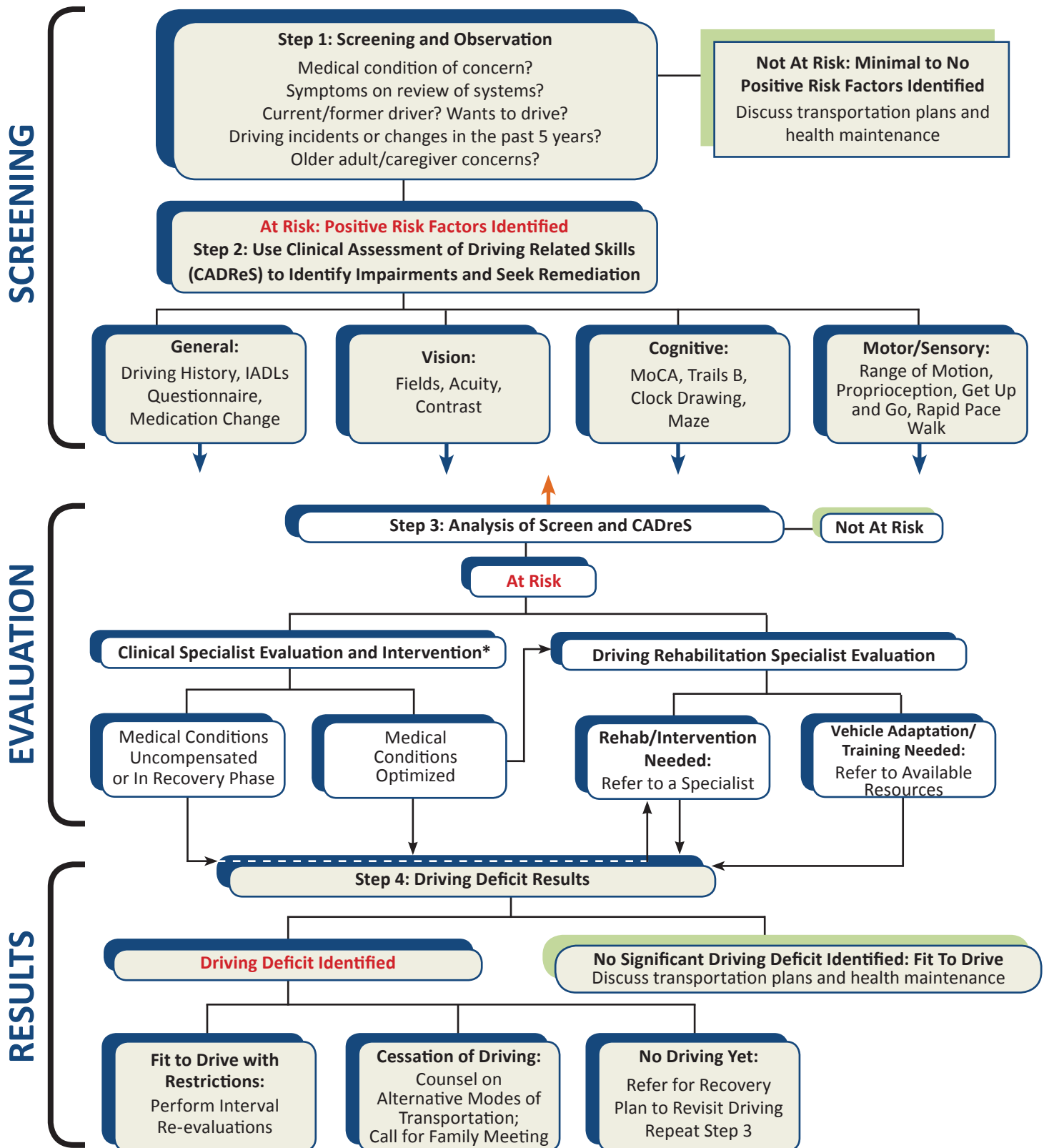
1. National Center for Statistics and Analysis. (2014, May, revised). Older Population. (Traffic Safety Facts 2012 Data Report No. DOT HS 812 005). Washington, DC: National Highway Traffic Safety Administration. Available at www-nrd.nhtsa.dot.gov/Pubs/812005.pdf
2. U.S. Census Bureau. (2012). Statistical Abstract of the United States. Washington, DC: Author.
3. Mizenko, A. J., Tefft, B. C., Arnold, L. S., & Grabowski, J. (2014, November). Older American Drivers and Traffic Safety Culture: A LongROAD Study. Washington, DC: AAA Foundation for Traffic Safety.
4. Perkinson, M. A., Berg-Weger, M. L., Carr, D. B., Meuser, T.M., Palmer, J. L., Buckles, V. D., ... Morris, J. C. (2005, October). Driving and dementia of the alzheimer type: beliefs and cessation strategies among stakeholders. *Gerontologist*, 45(5), 676-85.
5. National Center for Health Statistics. (2014). Table 18. Life expectancy at birth, at age 65, and at age 75, by sex, race, and Hispanic origin: United States, selected years 1900-2010. Health, United States, 2013: With Special Feature on Prescription Drugs. Hyattsville, MD: Author.
6. Centers for Disease Control and Prevention. The State of Aging and Health in American 2013. Atlanta, GA: Author. Available at www.cdc.gov/aging/pdf/State-Aging-Health-in-America-2013.pdf
7. United Nations, Department of Economic and Social Affairs, Population Division. (2013). World Population Ageing 2013 (Report No. ST/ESA/SER.A/348). New York: Author. Retrieved from the U.N. website at www.un.org/en/development/desa/population/publications/pdf/ageing/WorldPopulationAgeing2013.pdf
8. Staats, D. O. (2008). Preventing injury in older adults. *Geriatrics*, 63, 12–17.
9. CDC. (2007). 10 Leading Causes of Injury Deaths, United States, 1999-2007, All Races, Both Sexes. Office of Statistics and Programming, National Center for Injury Prevention and Control. Atlanta, GA: Author.
10. Insurance Institute for Highway Safety. (2014, March). Older drivers. Retrieved from the IIHS website at www.iihs.org/iihs/topics/t/older-drivers/fatalityfacts/older-people
11. Evans, L. (2000). Risks older drivers face themselves and threats they pose to other road users. *International Journal of Epidemiology*, 29, 315–322.

12. Nabors, D., Schneider, R., Leven, D., Lieberman, K., & Mitchell, C. (2008). Pedestrian Safety Guide for Transit Agencies. Washington, DC: Federal Highway Administration. Retrieved from the FHWA website at http://safety.fhwa.dot.gov/ped_bike/ped_transit/ped_transguide/intro.cfm
13. Bauza, G., Lamorte, W. W., Burke, P., & Hirsch, E. F. (2008). High mortality in elderly drivers is associated with distinct injury patterns: Analysis of 187,869 drivers. *Journal of Trauma Injury, Infection and Critical Care*, 64(2), 304–310.
14. Li, G., Braver, E., & Chen, L-H. (2003). Fragility versus excessive crash involvement as determinants of high death rates per vehicle mile of travel for older drivers. *Accident Analysis & Prevention*, 35(2), 227– 235.
15. Cicchino, J. B. (2015). Why have fatality rates among older drivers declined? The relative contributions of changes in survivability and crash involvement. *Accident Analysis & Prevention*, 83:67-73. doi: 10.1016/j.aap.2015.06.012
16. American Automobile Association. (2011). Finding the right vehicle for you. Retrieved from the AAA website at <http://seniordriving.aaa.com/maintain-mobility-independence/car-buying-maintenance-assistive-accessories/find-right-vehicle-you>.
17. Berkman, L. F., Glass, T., Brissette, I., & Seeman, T. E. (2000). From social integration to health: Durkheim in the new millennium. *Social Science & Medicine*, 51(6), 843–857.
18. Dickerson, A. E., Reistetter, T., & Gaudy, J. R. (2011). The perception of meaningfulness and performance of instrumental activities of daily living from the perspectives of the medically at-risk older adults and their caregivers. *Journal of Applied Gerontology*, 32(6), 749–764.
19. Ritter, A. S., Straight, A., & Evans, E. (2002). Understanding Senior Transportation: Report and Analysis of a Survey of Consumers Age 50+. Washington, DC: American Association for Retired Persons. Available at http://assets.aarp.org/rgcenter/il/2002_04_transport.pdf
20. Foley, D. J., Heimovitz, H. K., Guralnik, J., & Brock, D. B. (2002). Driving life expectancy of persons aged 70 years and older in the United States. *American Journal of Public Health*, 92(8), 1284–1289.
21. Naumann, R. B., West, B. A., & Sauber-Schatz, E. K. At what age do you think you will stop driving? View of older US adults. *Journal of the American Geriatric Society*, 62(10), 1999–2001.
22. Ragland, D. R., Satariano, W. A., & MacLeod, K. E. (2005). Driving cessation and increased depressive symptoms. *Journal of Gerontology, Series A: Biological Sciences and Medical Sciences*, 60, 399–403.

23. Rosenbloom, S., & Santos, R. (2014, April). Understanding older drivers: An examination of medical conditions, medication use, and travel behavior. Washington, DC: AAA Foundation for Traffic Safety.
24. Lyman, J. M., McGwin, G., & Sims, R. V. (2001). Factors related to driving difficulty and habits in older drivers. *Accident Analysis & Prevention*, 33(3), 413–421.
25. Kostyniuk, L. P., & Molnar, L. J. (2008). Self-regulatory driving practices among older adults: health, age and sex effects. *Accident Analysis & Prevention*, 40(4), 1576–1580.
26. Janke, M. K. (1991). Accidents, mileage, and the exaggeration of risk. *Accident Analysis & Prevention*, 23, 183–188.
27. Langford, J., Methorst, R., & Hakamies-Blomqvist, L. (2006). Older drivers do not have a high crash risk—a replication of low mileage bias. *Accident Analysis & Prevention*, 38(3), 574–578.
28. Okonkwo, O. C., Crowe, M., Wadley, V. G., & Ball, K. (2008). Visual attention and self-regulation of driving among older adults. *International Psychogeriatrics*, 20, 162–173.
29. Persson, D. The elderly driver: deciding when to stop. *Gerontologist*, 33(1), 88–91.
30. Preusser, D. F., Williams, A. F., Ferguson, S. A., Ulmer, R. G., & Weinstein, H. B. (1998). Fatal crash risk for older drivers at intersections. *Accident Analysis & Prevention*, 30(2), 151–159.
31. Williams, A. F., & Ferguson, S. A. (2002). Rationale for graduated licensing and the risks it should address. *Injury Prevention*, 8 (Suppl 2), ii9–ii16. doi: 10.1136/ip.8.suppl_2.ii9
32. Eberhard, J. W. (1996). Safe mobility for senior citizens. *International Association for Traffic and Safety Sciences Research*, 20(1), 29–37.
33. Langford, J., & Koppel, S. (2006). Epidemiology of older driver crashes-identifying older driver risk factors and exposure patterns. *Transportation Research, Part F*, 9, 309–321.
34. Lee, J. D. (2008). Fifty years of driving safety research. *Human Factors*, 50(3), 521–528.
35. Choi, M., Mezuk, B., & Rebok, G. W. (2012). Voluntary and involuntary driving cessation in later life. *Journal of Gerontological Social Work*, 55(4), 367–376.
36. Betz, M. E., Schwartz, R., Valley, M., & Lowenstein, S.R. (2012). Older adult opinions about driving cessation: a role for advanced driving directives. *Journal of Primary Care and Community Health*, 3(3) 150–154.

37. Dugan, E., & Lee, C. M. (2013). Biopsychosocial risk factors for driving cessation: findings from the health and retirement study. *Journal of Aging Health, 25*(8), 1313–1328.
38. Gillespie, L. D., Robertson, M. C., Gillespie, W. J., Lamb, S. E., Gates, S., Cumming, R. G., & Rowe, B. H. (2012). Interventions for preventing falls in older people living in the community. *Cochrane Database System Review, 9*, CD007146.
39. Meuser, T.M., Carr, D. B., & Ulfarsson, G. F. (2009, March). Motor-vehicle crash history and licensing outcomes for older drivers reported as medically impaired in Missouri. *Accident Analysis & Prevention, 41*(2), 246-52. doi: 10.1016/j.aap.2008.11.003.

Plan for Older Drivers' Safety (PODS)



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
 - - - Time Lapse

CHAPTER 2 IS THE OLDER ADULT AT INCREASED RISK OF UNSAFE DRIVING?

Key Points

- When taking the patient's history and reviewing the medical record, be alert to "red flags," which include any medical conditions, visual, cognitive, or motor changes, medications, functional decline, or symptoms or signs that can affect driving skills and safety.
- Do not make assumptions about whether an older adult is driving. Always be sure to ask about this key instrumental activity of daily living.
- Age alone is not a red flag for driving safety. The media often emphasizes age when an older driver is involved in an injurious crash, but this is ageism and not evidenced-based.
- Health care providers should take the approach of optimizing safe driving rather than simply stopping older adults from driving.

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 routine check-up. Mr. Phillips ambulates with a wide-based ataxic gait, uses a walker, and has impaired standing balance. He is unable to stand from the exam chair without multiple attempts and use of his arms, and he reports feeling temporarily lightheaded on standing. He is no longer able to read newspaper print and tells you he avoids driving at night and only goes short distances to run errands, get to appointments, and meet weekly with his bridge club.

Mrs. Bales, a 90-year-old woman, lives in a continuing care retirement community with her 92-year-old husband for whom she is the primary caregiver because of his Parkinson's disease. Her past medical history includes degenerative joint disease and hypertension. She has decreased range of motion in her neck and walks without an assistive device but with a wide-based gait. She drinks a moderate amount of alcohol daily and was recently started on oxycodone for chronic pain.

This chapter discusses the first steps of the *Plan for Older Drivers' Safety* (PODS) and, in particular, provides a strategy for answering the question "Is the older adult at increased risk of unsafe driving?" This part of the evaluation process includes clinical observation of the older adult, identifying red flags such as medical conditions and medications that may impair safe driving and inquiring about new-onset driving behaviors that may indicate declining traffic skills. The goal of the assessment is to facilitate driving safety among older adults and assure that those who can drive safely are helped to do so.

Steps To Answer this Question

Observe the older adult throughout the encounter.

Careful observation is often an important step in diagnosis. Clinicians should observe the older adult and be alert to:

- Sensory deprivation such as impaired vision, hearing or decreased sensation in the extremities
- Inattention or loss of insight regarding personal care (e.g., poor hygiene and grooming)
- Impaired ambulation (e.g., difficulty walking or getting into and out of chairs)
- Difficulty with way finding (e.g., getting to or out of the office)
- Impaired attention, memory, language expression, or comprehension
- Difficulties or lack of insight related to managing medical encounters, such as missed appointments, repeated phone calls for the same issues, or appearing on the wrong day.

In the example above, Mr. Phillips has difficulty with balance and strength as revealed by his inability to get up from the chair without multiple tries and his wide-based gait. Moreover, he has visual changes such that he cannot read print of typical size. This raises a question as to whether he can operate vehicle foot pedals properly or see well enough to both drive and find his way safely. His physical limitations may not preclude driving, but they may be indicators that more assessment is indicated.

Be alert to conditions in the older adult's medical history, examine the current list of medications, and perform a comprehensive review of systems.

During an interview of the older driver, clinicians should be alert to “red flags,” i.e., any medical condition, medication, or symptom that can affect driving skills, either through acute effects or chronic functional deficits (see Chapter 9). For example, Mr. Phillips (introduced in previous chapter) presents with lightheadedness associated with atrial fibrillation. Symptoms of dizziness should be considered as a red flag, and Mr. Phillips should be counseled to cease driving until his symptoms are diagnosed, treated and resolved. Significant pain and associated limitations in function seen with degenerative joint disease, such as those noted with Mrs. Bales, should also be considered “red flags.” Other conditions may impact safety and/or require training to use compensatory techniques when driving, e.g., limited range of motion in the neck. Acute or chronic pain can also be distracting and make it unsafe for older adults to drive. Many factors can put individuals at risk of unsafe driving and should be explored during office visits (Table 2.1).

Table 2.1 Clinical Risk Factors for Impaired Driving

Risk Factor	Signs and Symptoms
Physical capabilities	History of falls Impaired ambulation Vision and/or hearing impairment Functional impairment with regard to use of gas or brake pedals Decreased ability to turn the head to fully visualize an area
Cognitive ability	Decreased short-term memory Decreased or impaired way finding Easily distracted Inability to learn new information quickly Inability to recognize unsafe situations
Driving ability	Not using turn signals appropriately Difficulty turning the wheel and making turns Difficulty staying in the correct driving lane Difficulty judging the space between cars or upcoming exits Hitting curbs when parking or backing up Stopping in traffic inappropriately Not following stop signs, yield signs, traffic lights, etc. Not noticing workmen or activity on side of the road Inappropriate speeds for the weather/driving conditions History of traffic violations, minor crashes, or warnings

Most older adults have at least one chronic medical condition and many have multiple conditions, the most common including arthritis, hypertension, hearing impairments, heart disease, cataracts, dizziness, orthopedic impairments, and diabetes.¹ The impact of multiple comorbidities is not well-known. Some of these conditions have been associated with driving impairment by virtue of both their symptoms and their treatments (e.g., medications and medication adverse effects) that can influence driving safety. These conditions will be discussed in more detail in subsequent chapters, including a reference list of medical conditions and medications that may affect driving in Chapter 9, with some of the more common chronic conditions noted below in Table 2.3.

Older adults generally take more medications than their younger counterparts and are more susceptible to adverse effects. The Beers Criteria for potentially inappropriate medication use in older adults is a useful tool for screening medication lists.² Whenever medication is prescribed or the dosage of a current medication is changed, it is important to inform the older adult of potential effects or drug-drug interactions that might affect driving safety. Adverse effects, such as drowsiness, confusion, dizziness, or nausea, can impact the ability to concentrate and drive safely. Concern may be heightened in the face of already-present underlying concerns about visuospatial processing speed, cognition, or functional changes (e.g., the Trails B test [see Chapters 3 and 4]), slow response time, and decreased attention.

The review of systems can reveal symptoms that may interfere with driving ability. For example, loss of consciousness, confusion, falling asleep while driving, feelings of faintness, memory loss, visual impairment, numbness or tingling in extremities, and muscle weakness all have the potential to affect driving safety.

The clinical team should not make assumptions about whether an older adult is driving and should always be sure to ask about this important activity of daily living. Sometimes, older drivers themselves or caregivers may raise concerns. If the older adult or his or her caregiver asks your opinion about whether the individual is safe to drive, any concerns that have been noted should be explored. Has the older adult had any recent accidents, near-accidents, citations or crashes? Is he or she feeling uncomfortable or unsafe driving? A list of specific driving behaviors that could indicate concerns for safety are found in the Fitness to Drive measure freely available online.³ Clinicians should encourage caregivers to monitor and observe skills of the older adult driver in real-world traffic situations, with full disclosure and permission from the older driver. Concern should be noted if caregivers will not drive with the individual or let others drive with him or her. If the older adult is living in a retirement community (or continuing care retirement community, assisted living, etc.), it may be helpful to explore with staff if they have noticed any driving behaviors that might indicate unsafe driving (e.g., inappropriate speeds, not stopping at stop signs, not slowing over curb bumps, bumping into/scraping other cars).

Age alone is not a red flag! Unfortunately, the media often emphasizes age when an older driver is involved in an injurious crash. This “ageism” is a well-known phenomenon in U.S. society.⁴ Although many people experience a decline in vision, cognition, or motor skills as they get older, these changes occur at different rates, and older adults experience functional changes to different degrees. The focus should be on functional abilities and medical fitness to drive versus on age per se. The clinical team should take the approach of optimizing safe driving rather than simply stopping the individual from driving.⁵

Inquire about driving during the social history and health risk assessment.

A health risk assessment is a series of questions intended to identify potential health and safety hazards in the older adult’s behaviors, lifestyle, and living environment (Table 2.2). The health risk assessment is tailored to the older adult and generally focuses on physical activity, falls, drinking (alcohol), medication management, and driving. Questions about driving should be integrated into the health risk assessment.

Table 2.2 Questions About Driving

Exploratory Questions	Health Risk Assessment Questions
How did you get here today? Do you drive? How much do you drive? Do you drive to the store? hairdresser? bank? Do you drive at night? Have you lost any confidence in your ability to be a safe driver? Have others expressed concern about your driving?	Physical activity and diet history Daily alcohol intake Daily medication management concerns or use of sedating medications History of falls Use of seat belts
What would you do if you had to stop driving? Are comfortable when seated in your car? Tell me about your ability to see signs when driving? To manage the steering wheel? To manage the foot pedals? To visualize the street signs? To visualize the traffic lights and signs? Do you often get lost while driving? Have you received any traffic violations or warnings in the past 2 years? Have you had any accidents or near-accidents in the past 2 years?	
<i>Questions for caregivers if concerns are raised:</i>	
How often do you believe_____drives? Have you had the opportunity to ride with _____in the past month? Do you feel safe in the car when riding with _____? Do you have any concerns about_____driving ability? If a patient presents a form from the licensing agency, the clinician should ask why they are being asked to submit the form.	

If the older adult drives, then his or her driving safety should be addressed if red flags are raised. In addition, whenever there is any change in a medical condition or medication that could impact driving, the impact on driving safety should be considered. For example, Mrs. Bales should be cautioned regarding driving because of her use of a new narcotic and to consider a short driving-free period while she evaluates its impact on her driving skills.

In contrast, for chronic medical conditions, driving safety is addressed by formally assessing the functions important for driving (see Chapter 3). Chronic medical conditions, such as degenerative joint disease or congestive heart failure should be considered when evaluating

driving ability and safety. For example, an older adult with congestive heart failure may have an acute exacerbation, resulting in the need for increased use of diuretics and, therefore, risk of dizziness, fatigue, or electrolyte imbalance. This individual might not be safe to drive and should be counseled to avoid driving until the symptoms of heart failure, including fluid buildup, have resolved, the heart failure is compensated, and she has resumed maintenance treatment. Ongoing evaluation after stabilization is needed. The clinician should also recommend formal assessment of function as described in chapters 3 and 4 if the older adult shows any signs of chronic functional decline. (For more complete recommendations on medical conditions (e.g., diabetes) and medications that may affect driving, see Chapter 9.)

If the older adult does not currently drive, ask if he or she ever drove and what was the reason for stopping. If the older adult voluntarily stopped driving because of medical reasons that are potentially treatable, it may be possible to help him or her return to safe driving. In this case, formal assessment of function can be performed to identify specific areas of concern and serve as a baseline to monitor the individual's improvement with treatment. Referral to a driver rehabilitation specialist in these cases is strongly encouraged (see Chapter 5).

When exploring driving ability, it is very useful to also speak with a caregiver to confirm what the older adult has stated. As noted above, if the older adult lives in a retirement community or continuing care retirement community, the staff may also be able to provide invaluable information with permission because they have the opportunity to observe the individual's driving activities, techniques, and safety.

If caregivers are particularly concerned, it may be helpful to have them review some driving simulations with the older adult; these are available on the AARP webpage (www.aarp.org/home-family/getting-around/driving-resource-center/info-08-2013/interactive-driving-simulations.html). These simulations include situations such as making left-hand turns, hazard detection, and lane changes. In addition, older adults can be encouraged to review the AARP's *"My Driving Plan,"* which is a guide to help older adults continue to drive safely as they age.

Understand the older adult's mobility needs.

Asking about the older adult's mobility needs and encouraging him or her to begin exploring alternative transportation options before it becomes imperative to stop driving is advised. When a diagnosis is encountered that may lead to the need for adaptive equipment or driving cessation, the clinician should advise the older adult of the potential impact on driving. For example, an older adult with multiple sclerosis could be advised that hand controls might be necessary in the future. Without ongoing discussion, older adults who have not planned for any forms of alternative transportation may feel that they have no choice but to continue driving, increasing their likelihood of continuing to drive after they may have lost the capacity to do so. *Even if alternative transportation options are not needed at this point, it is wise for older adults to plan ahead in case it becomes necessary.*

Some questions to use to initiate this conversation using the Hartford “We Need to Talk” discussion materials⁶ include:

- How do you usually get around?
- If your car ever broke down, how would you get around? Is there anyone who can give you a ride? Can you use public transportation, such as a bus or train? Does your community offer a shuttle service or volunteer driver service?

It can also be useful to explore the cost/benefit of driving (such as car maintenance and insurance) versus using a cab service, Uber, Lyft, or other type of public or community transportation.

Older adults should be encouraged to plan a safety net of transportation options. It can be helpful to link independent mobility to clinical concern for the older adult’s well-being with phrases such as “Mobility is very important for physical and emotional health. If you were ever unable to drive for any reason, I’d want to be certain that you could still make it to your appointments, pick up your medications, go grocery shopping, and visit your friends.”

Sources of educational materials on alternatives to driving are listed in Appendix B and include the National Center on Senior Transportation’s material.⁷ Other resources are available through AARP (www.aarp.org/home-family/getting-around/driving-resource-center/driving-resource-center-getting-started2/) and the University of Michigan Transportation Research Institute (www.umtri.umich.edu/critical-issues/senior-mobility).⁸ If an older driver must stop driving, the transition will be less traumatic if he or she has already created a transportation plan. In addition, the handout *Getting By Without Driving, or Transportation Options for Older Adults* can help the older adult get started (Appendix B).

Counseling Older Adult Drivers in the Inpatient Setting

When caring for older adults in the acute hospital setting, it is critical to use this opportunity to consider driving and if the individual is currently safe to do so.⁹ Counseling may include recommendations for temporary or permanent driving cessation or for driving assessment and rehabilitation when the individual’s condition has stabilized. Such recommendations are intended to promote safety and, if possible, help the older adult regain his or her ability to drive. Case managers may be able to assist with supporting older adults when this recommendation is necessary. This recommendation should be included within the discharge summary that goes to the rehabilitation/subacute setting and/or to the older adult’s primary care provider.

Red Flags for Further Assessment

Older Adult Driver's or Caregiver's Concern

Regardless of the setting of care, older adult drivers and their caregivers may express concerns about driving safety. If so, the cause of concern should be investigated, specifically if there have been recent motor vehicle crashes, near-crashes, traffic tickets, instances of becoming lost, poor night vision, forgetfulness, or confusion. Function should be evaluated using the Clinical Assessment of Driving Related Skills (CADReS) tests (Chapters 3 and 4).

Acute Events

Any acute event, whether requiring hospitalization or not, is a red flag for immediate assessment of driving safety. If the older adult has been hospitalized, it is particularly important to counsel him or her as well as caregivers on driving safety issues. Acute disease exacerbations can serve as an opportunity to address, or re-address driving concerns. As a general recommendation, older adults should cease driving until cleared to drive by their primary care provider in the event of any of the following common acute events.

- Acute myocardial infarction
- Acute stroke or other traumatic brain injury
- Arrhythmia (e.g., atrial fibrillation, bradycardia)
- Lightheadedness, dizziness
- Orthostatic Hypotension
- Syncope or presyncope
- Vertigo
- Seizure
- Surgery
- Delirium from any cause
- New sedating medications or those that can cause confusion or dizziness

Chronic Medical Conditions

Older adults may require focused assessments to determine the impact of the following chronic medical conditions on their level of function (detailed information in chapter 9):

Table 2.3 Chronic Medical Conditions that May Impact Driving

Medical Condition	Examples
Diseases/conditions affecting vision	Cataracts Diabetic retinopathy Macular degeneration Glaucoma Retinitis pigmentosa Field cuts Low visual acuity even after correction
Cardiovascular disease, especially when associated with presyncope, syncope, or cognitive deficits	Unstable coronary syndrome Arrhythmias Palpitations Congestive heart failure Hypertrophic obstructive cardiomyopathy Valvular disease
Neurologic disease	Dementia Multiple sclerosis Parkinson disease Peripheral neuropathy Brain injury Spinal cord injury
Psychiatric disease	Mood disorders Depression Anxiety disorders Psychotic illness Personality disorders Alcohol or other substance abuse
Metabolic disease	Type 1 and type 2 diabetes mellitus (especially with hypoglycemic attacks or severe swings in blood glucose) Hypothyroidism
Musculoskeletal disabilities	Arthritis and foot abnormalities Contractures and decreased range of motion Inflammation Pain
Respiratory disease	Chronic obstructive pulmonary disease Obstructive sleep apnea
Chronic renal failure	
Cancer and chemotherapy	

Medications

Many nonprescription and prescription medications have the potential to impair driving ability, either by themselves or in combination with other drugs. Combinations of drugs may affect drug metabolism and excretion, and dosages may need to be adjusted accordingly. In addition, clinicians should always ask about alcohol use and timing of intake (for more information on each medication class that may affect driving, see Chapter 9). Medications with strong potential to affect driving ability include:

- Anticholinergics,
- Anticonvulsants,
- Antidepressants,
- Antiemetics,
- Antihistamines,
- Antihypertensives,
- Antiparkinsonian agents,
- Antipsychotics,
- Benzodiazepines and other sedatives/anxiolytics,
- Muscle relaxants,
- Narcotic analgesics,
- Stimulants,
- Hypnotics, and
- Other agents with anticholinergic side effects.

Review of Systems

The review of systems can reveal symptoms or conditions that may impair driving performance. Symptoms associated with acute and chronic medical problems are critically important red flags and should be carefully explored.

Table 2.4 Organ Systems and Symptoms

Organ System	“Red Flag” Symptoms
General	Fatigue Weakness Dizziness
Head, ears, eyes, nose, throat (HEENT)	Headache Head trauma Double vision Visual changes Vertigo Change in ability to read Change in visual acuity
Respiratory	Shortness of breath Use of oxygen
Cardiac	Chest pain Dyspnea on exertion Palpitations Sudden loss of consciousness Increased swelling in the legs
Musculoskeletal	Muscle weakness Pain Joint stiffness or pain Decreased range of motion
Neurologic	Loss of consciousness
Neurologic	Loss of consciousness Faintness Seizures Weakness Paralysis Tremors Loss of sensation Numbness Tingling
Psychiatric	Depression Anxiety Changes in memory and ability to recall recent events, confusion, psychosis, mania, or difficulty with word finding, way finding, decision making, or concentration

Assessment and Plan

Clinicians should consider screening at-risk older adults using red flags and identifying common signs, symptoms and medical conditions associated with impairment of driving safety in every clinical setting where older adults are encountered. When formulating a diagnosis and treatment plan for older adults, driving safety should be addressed whenever needed.

Identification of risk early on may facilitate primary prevention and interventions to prevent the loss of driving ability. Ongoing monitoring of chronic illness may facilitate secondary prevention efforts to rehabilitate the loss of driving skills and attempts to restore those skills.

Red flag indicators and acute events may signal that irreversible loss of driving skills has occurred and tertiary prevention should include recommending alternatives to driving to avoid harm to the older adult and others. It is also critically important to recognize that some older adults may have impaired insight with regard to their driving safety, and self-reports should be confirmed with caregivers or others who may be familiar with the older adult's driving ability.¹⁰

In summary, assessment of driving safety can and should be routinely integrated into the care plan when:

- A new diagnosis or change occurs in any condition that has been associated with impaired driving;
- A new medication is prescribed, or the dosage of a current medication is changed;
- A change in functional abilities is reported; or
- As part of an annual wellness visit.

References

1. Dickerson A. E., Meuel D. B., Ridenour C. D., & Cooper, K. (2014, November-December). Assessment tools predicting fitness to drive in older adults: A systematic review. *American Journal of Occupational Therapy*, 68(6), 670–680.
2. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. (2015, November). American Geriatrics Society 2015 updated Beers Criteria for potentially inappropriate medication use in older adults. *Journal of the American Geriatrics Society*, 63(11), 2227-46. doi: 10.1111/jgs.13702
3. University of Florida Institute for Mobility, Activity and Participation. (2013). Fitness-to-drive screening measure online (Web Page). Retrieved from the University of Florida website at <http://fitnesstodrive.phhp.ufl.edu/>
4. Nelson, T. (2002). *Ageism: Stereotyping and Prejudice Against Older Persons*. Cambridge, MA: MIT Press.
5. Golisz, K. (2014, November-December). Occupational therapy interventions to improve driving performance in older adults: a systematic review. *American Journal of Occupational Therapy*, 68(6), 662–669.
6. The Hartford Financial Services Group, Inc. (2015, July). Family Conversations with Older Drivers. Available at: www.thehartford.com/sites/thehartford/files/we-need-to-talk-2012.pdf
7. National Center on Senior Transportation. Transportation options for older adults. Retrieved from the NCST website at www.seniortransportation.net/Portals/0/Cache/Pages/Resources/Trans_Options_Panels.pdf
8. University of Michigan Transportation Research Institute. (2007). Senior Mobility (Web page). Retrieved from the UMTRI website at www.umtri.umich.edu/critical-issues/senior-mobility
9. Baker, A., Bruce, C., & Unsworth, C. (2014). Fitness-to-Drive for acute care and ADHD. *Occupational Therapy Practitioner*, 19(10), 7–10.
10. Wood J. M., Lacherez, P. F., & Anstey, K. J. (2013). Not all older adults have insight into their driving abilities: evidence from an on-road assessment and implications for policy. *Journal of Gerontology, Series A: Biological Science and Medical Science*, 68(5), 559–566.

CHAPTER 3 SCREENING AND ASSESSMENT OF FUNCTIONAL ABILITIES FOR DRIVING

Key Points

- An assessment of underlying functional abilities important for safe driving (e.g., vision, cognition, motor) should determine the need for further evaluation and subsequent intervention, and/or for a more specialized driving evaluation.
- Significant functional impairment may necessitate cessation of driving with assistance in developing a plan for alternative methods of transportation.
- Older adults with visual and/or physical impairments have a greater potential for continuing safe driving than those with cognitive impairment, since adaptive equipment and compensatory strategies are available.
- No single assessment can accurately predict fitness to drive; an array of assessment tools should be used to determine risk in older adults.
- The Clinical Assessment of Driving Related Skills (CADReS) is a toolbox of evidence-based practical, office-based functional assessment tools in the key areas of vision, cognition, and motor/sensory function related to driving.
- Self-report or self-assessment has not been shown to be an adequate measure of fitness-to-drive largely because of the overlearned skill set of driving combined with the intense desire to remain driving independently.

Mr. Phillips (introduced in previous chapters) has been accompanied to the clinic by his son, who is in the examination room with him. Mr. Phillips tells you that he is a safe driver. You request and obtain permission to interview the son, who voices his concern. Four months ago, Mr. Phillips was involved in a minor car crash, which was his fault. He has also had several near-crashes in the past 2 years. He has never been lost while driving.

In discussing Mr. Phillips' transportation options, you learn that he drove himself to this appointment. Driving is Mr. Phillips' main mode of transportation, and he drives almost every day. Although Mr. Phillips is certain—and his son confirms—that family members and neighbors would be willing to drive him wherever he needs to go, he has never asked for rides. "Why should I ask for rides when I can just drive myself? Besides, I don't want to impose on my family or friends."

Increasing longevity in the U.S. population means that, because of comorbid conditions, many older adults may outlive their ability to drive safely. Men are projected to live approximately 6 years and women 10 years longer than their ability to drive.¹ This chapter focuses on the functional abilities needed for driving. It is important to distinguish between screening older

adults for functional disability that may impair driving and conducting a more detailed assessment that identifies at-risk drivers who may benefit from intervention strategies. The goal is to optimize the ability of older adults to continue to drive safely for as long as possible.

The clinical team may detect problems that (1) allow early intervention and may prevent disability and prolong driving ability, (2) identify impairments that can be remediated, (3) identify strategies to compensate for a medical condition, and (4) plan for the timely transition to alternative means of transportation.

Primary prevention addresses issues to prevent the loss of driving ability and includes starting the conversation about transitions and planning for driving retirement. This is helpful for all older adults, especially those with chronic medical conditions that may eventually affect driving (e.g., diabetes, dementia, Parkinson disease). For example, when counseling an older adult with diabetes, in addition to explaining how to manage blood sugar levels, it may be helpful to explain how to help minimize peripheral nerve damage to prolong the ability to drive independently. This potentially is a highly motivating and important way to optimize adherence.

Chapter 2 outlined what factors or “red flags” to observe if driving is of concern to the older adult, caregiver, or clinical team member. This chapter goes beyond the initial screening process for those older adults recognized to have a possible safety risk who need further exploration of their fitness to drive.

Secondary prevention attempts to remediate any loss of driving skills that have already occurred as well as to prevent further loss of driving ability.

Screening Versus Assessment

Screening

Screening for unsafe driving requires the use of simple tools to identify the possibility of risk. The goal is to identify all older adults drivers who might be “at risk” of unsafe driving, with the understanding that some individuals who are not at risk will also be incorrectly identified.

Assessment

Assessment requires more in-depth evaluation to distinguish between individuals who are truly at risk and those who are not. It is important to note that screening and assessment tool scores do not by themselves predict crash risk for many reasons, including the relatively low occurrence of crashes and because older adults are often low-risk individuals compared to the general population. It is the clinical skill, expertise, and reasoning of the health care provider during assessment of the older adult that allows a judgment about probable driving outcome.

The Transportation Research Board Committee for Safe Mobility for Older Persons² has developed definitions for screening, assessment, and evaluation (Table 3.1).

Table 3.1 Screening, Assessment, and Evaluation Terminology

Term	Definition
Road test	An examination of driving maneuvers and knowledge of rules of the road performed in a motor vehicle on a public highway or street
Driving test	An examination including specified driving maneuvers performed in a motor vehicle
Evaluation	Obtaining and interpreting data to document results and inform an individualized mobility plan
Assessment	Use of specific measurements, tools, or instruments during the evaluation process
Screening	Obtaining and reviewing data to determine the need for evaluation
Self-screening	An individual obtains and reviews his or her own data to determine the need for evaluation
Proxy screening	An individual obtains and reviews data to determine the need for evaluation for another person
Evaluator screening	A professional skilled in a specific screening tool obtains and reviews data to determine the need for evaluation of a specific individual
Driving assessment	Use of an on-road test to measure and qualify driving skills and abilities, which may be triggered by a screening outcome that indicates increased risk of driving impairment or crash involvement
Driving evaluation	Obtaining and interpreting data and documenting results to inform an individualized mobility plan based on an individual's driving abilities and/or potential to be an independent driver, or inform a determination of fitness to drive
Clinical driving evaluation	Obtaining and interpreting data and documenting results to determine fitness to drive through assessment of sensory/perceptual, cognitive, and/or psychomotor functional abilities using specific tools or instruments
Comprehensive driving evaluation	A complete evaluation of an individual's driving knowledge, skills, and abilities that includes (1) medical and driving history; (2) clinical assessment of sensory/perceptual, cognitive, or psychomotor functional abilities; (3) on-road assessment, as appropriate; (4) an outcome summary; and (5) recommendations for an inclusive mobility plan, including transportation options

Multiple assessment tools are used for screening and assessment of driving.³ However, except for on-road assessment, there is no single tool at present that should be used to determine fitness to drive.⁴⁻⁹ Older adults have typically been driving for 30 to 50 years and may have overlearned skills and abilities that compensate for deficits detected with office-based tools. Computer-based screening or assessment tools for someone who may not use technology frequently may result in test failure because of lack of familiarity with the technology rather than because of deficits in driving ability.

Clinical team members may perform screening, assessment, and clinical driving evaluation, which may then permit health care and community interventions. Team members can then determine whether to refer the older adult to a driver rehabilitation specialist for a comprehensive driving evaluation or whether to facilitate a decision about cessation of driving.

Health care providers are in the best position to determine if the at-risk older adult requires a referral to another health care provider (e.g., ophthalmologist, occupational therapist, driver rehabilitation specialist) for an evaluation for a specific deficit. Although cut-off scores might be provided, it is important to remember that the assessment tools discussed below demonstrate only the presence of a problem, not its cause.

Clinical team members must function within their scope of practice and use clinical judgment regardless of test scores to make decisions about fitness-to-drive of older adults. All available information, including driving and medical history, should be considered. The specific tools discussed here were selected for their applicability and feasibility in an office setting, along with their correlates with impaired driving outcomes, but they cannot cover every important function needed for driving.

Broaching the Issue of a Driving Screening or Assessment With the Older Adult

The primary message should be one of concern and assistance, balancing the older adult's or caregiver's concern about the safety of the older adult and/or the public and the older adult's need for transportation. Care should be taken to avoid an adversarial position, because this may prompt an unproductive reaction of defensiveness. The conversation should begin with a commitment to explore all reasonable options for keeping the older adult mobile in his or her community. Points to emphasize include that screening and assessment are necessary to identify ways to help the older adult continue to drive safely as long as possible, and that current technology, roadways, and rehabilitation offer many helpful interventions to do so. If the older adult expresses fear that the clinical team will "take away my driver's license," it may be helpful to offer reassurance that only the State licensing agency has that type of legal authority (see Chapter 7).

“Mr. Phillips, I’m concerned about how your condition is affecting your driving. Your son tells me that you were recently in a car crash and that you’ve had several near-crashes in the past 2 years. Although you have managed your medical condition, I believe it may have progressed to the point that it may be affecting your driving skills and ability. I am going to ask you to do a few simple tests that can measure functional abilities needed for safe driving, such as walking down the hall while I time you. This will help us find out if there are areas we need to look into further.

“Based on your health condition and the results of the tests, we’ll do our best to treat or reverse any problems we find. For example, if you’re not seeing as well as you should, we’ll see what we can do to improve your vision. If you have difficulty turning your head, a referral to a physical therapist may be in order. If there’s something we can’t improve, then we may consult a driving rehabilitation specialist to explore all possible solutions. This type of specialist, typically an occupational therapist, will offer you further testing and then go out on the road with you to see how you’re driving. The driving rehabilitation specialist can develop a plan that will include, if at all possible and safe, recommendations, strategies, and maybe adaptive equipment for you to consider. Whenever possible, the driving rehabilitation specialist will recommend ways to make your driving safer. Our goal is to keep you on the road for as long as you are safe to drive.”

Functional Areas Assessed for Driving

Three key functional areas are considered as the foundation for fitness to drive: vision, cognition, and motor/somatosensory function. Any impairment in these areas has the potential to increase the older adult’s risk of being involved in a crash. Once these areas are assessed, the health care provider can determine if more information is required in one or all areas or if referral to a specific specialist for further evaluation or intervention is needed (e.g., ophthalmologist, neuropsychologist, driver rehabilitation specialist).

Vision

A vision assessment includes assessment of visual acuity, visual fields, and contrast sensitivity.

Vision is the primary sense used in driving and is responsible for most of the driving-related sensory input.¹⁰ In most States, vision testing is required to obtain a driver’s license. Several States also require vision testing at the time of license renewal. For information on these laws, see Chapter 8.

Visual Acuity: Visual acuity commonly declines with age, although no consensus exists on the rate of decline or decade of onset. Decline in acuity is related to physiologic changes of the eye that occur with age and the increased incidence of diseases such as cataracts, glaucoma, diabetic retinopathy, and age-related macular degeneration (ARMD).¹¹ Although distance visual acuity appears to be crucial to many driving-related tasks, declines in near visual acuity may be

associated with difficulty seeing/reading maps or gauges and controls inside the vehicle.

Most research studies show that visual acuity is not linked to crash risk,^{8, 12-14} which may be because of the variability in visual requirements by State licensing agencies. There is some evidence that visual screening laws are associated with decreased motor vehicle crash fatality rates.¹⁵ Cataracts are another major concern associated with vision and driving. The gradual development of cataracts results in a slow change in vision, which the older adult may not recognize. Identification and removal of cataracts can effectively improve driving safety.¹⁶⁻¹⁸

General visual acuity can be easily measured in the office setting using readily available tools such as a Snellen chart (www.provisu.ch/Age/Snellenchart_en.pdf). Near visual acuity can be assessed by the Rosenbaum pocket chart and there are several free apps available for smartphones. Some States license low-vision drivers; in this case, driver rehabilitation programs may offer specialized services that include the training and provision of specially designed adaptive devices. For the cognitively intact driver, these specialized programs may offer options for continued driving.

Visual Field: Visual fields may decline as a result of natural aging changes such as ptosis, a drooping of the eyelid most commonly found in the older population. Most visual field cuts, however, are the consequence of medical conditions such as glaucoma, optic neuritis, detached retina, and stroke/traumatic brain injury. Drivers with loss of peripheral vision may have trouble noticing traffic signs or cars and pedestrians about to cross their path. The evidence examining the relationship between visual field loss and driving performance is still evolving,¹⁹ Visual fields are measured through confrontation testing.

Contrast Sensitivity: Older adults require about three times more contrast than young adults to distinguish a target against its background. Low light levels exacerbate this deficit. Thus, older adult drivers may have problems distinguishing cars or pedestrians against the driving background; this may be much worse at night or during storms.²⁰ Impairment should be addressed by offering strategies that include avoiding driving during dawn and dusk hours, in foggy conditions, or during storms. Because impaired contrast sensitivity is a valid predictor of crash risk among older adult drivers,¹⁹ it could be included in routine eye examinations by primary care providers. Contrast sensitivity can be evaluated with specially printed cards. More research is needed to produce standardized, validated cut-off points for contrast sensitivity and the level at which impairment results in decreased driving safety. These tests are rarely performed outside ophthalmology practice settings.

Several other visual functions are important in driving (light adaptation, accommodation, dynamic visual acuity, color perception), but office-based measures that can be used for screening and assessment are neither easily available nor linked to crash risk. Therefore, they are not discussed here.

Cognition

Cognitive assessment includes functional assessments of memory, visual perception/processing, attention, executive function, language, and insight.

Driving requires timely visual and cognitive processing to make appropriate decisions in a dynamic and complex environment. The best assessment tools integrate several cognitive processes (e.g., divided attention and visual processing) to test high-level cognitive processes, such as executive functioning.²¹ At the clinical team level of screening, specific cognitive abilities and skills can be assessed for deficits indicative of risk. Because these functions are the building blocks of more complex abilities, if an older adult has a significant issue with any basic cognitive skills, it will likely affect driving.

Memory: To drive safely, drivers need to remember their destination, how to navigate to the destination, how to operate the vehicle, and to obey traffic rules and regulations.²² In addition, drivers must be able to retain certain information while simultaneously processing other information, using the skill of working memory. Working memory (and the other cognitive skills to which it contributes) tends to decline with age.²³

Visual Perception/Processing: Visual perception and processing as well as visuospatial skills are necessary for drivers to organize visual stimuli into recognizable forms and understand where they exist in space. Without these skills, drivers would be unable to recognize another vehicle and determine its distance ahead to maintain speed, slow, or stop in relation to that vehicle. In general, visual processing may slow²⁰ and complex visuospatial skills may decline with age, while visual perception remains stable.²⁴

Attention: Because of the dynamic and changing environment, demands on attention can be significant, especially in areas of high traffic or during rush hour traffic. Drivers must possess selective attention (i.e., the ability to prioritize stimuli and focus on only the most important) to attend to critical stimuli (e.g., traffic lights, other vehicles, pedestrians) without being distracted by irrelevant ones (e.g., billboards, city sights). In addition, drivers must possess divided attention to focus on the multiple stimuli required by most driving tasks. For example, the driver must be able to attend to vehicles surrounding him or her while changing lanes for a turn, maintaining a safe speed, and activating the turn signal in the correct direction.

Attentional functioning may decline with age,²⁵ with divided attention showing more pronounced changes than selective attention.²⁶ However, regardless of age, the divided attention from using cell phones is clearly a significant safety risk. Older adults should be advised to avoid using cell phones while driving because of the possibility of decreased working memory and attention reserves.

Executive Function: Executive function is an umbrella term that refers to the coordination of several cognitive subprocesses to achieve a particular goal.²⁷ Executive function acts as a supervisor of all cognitive processes²⁸ and includes initiation of a task, problem solving, planning, sequencing, flexibility in thinking, and impulsivity. Executive skills allow drivers to make the decision to stop at a red light or when the light is green if a pedestrian is in the path of the vehicle. Although the capacity for this kind of logical analysis tends to decline with age,²⁶ it is with brain injury that the problems with executive functions become more evident in driving. Because of the overlearned ability of driving, many drivers with executive function deficits can drive familiar routes without a problem. However, if an unexpected event occurs (e.g., a child running onto the street, a familiar road is closed because of construction), older adult drivers with poor executive functioning may put themselves or others at risk.

Insight: Insight is the awareness that a person has about himself or herself, including abilities and limitations. It is important to determine the older adult's understanding of how his or her physical and/or mental limitations may affect fitness to drive. For example, the individual with glaucoma should understand and agree that he or she should refrain from driving at night but may drive without significant risk during daylight and non-rush hours. Individuals with dementia may not have adequate insight, believing they are fit to drive when they are not.

Motor and Somatosensory Function

Motor and somatosensory function assessment includes functional assessments of functional range of motion, proprioception, and endurance.

Driving requires motor and somatosensory abilities. Driver rehabilitation excels at the prescription of and training in the use of strategies, devices, or vehicle modifications to compensate for a wide range of physical and somatosensory impairments. Because of improvements in technology (e.g., antilock braking systems, power seats, power steering, keyless ignition, traction control systems, backing cameras), driving has become much less physically demanding. Thus, physically frail older adults may not have limitations in continuing to operate a motor vehicle. The amount of muscle strength and range of motion necessary to physically operate a vehicle has decreased, although basic motor skills and abilities are still needed.

Endurance: Before the act of driving, motor abilities are needed to enter the car safely and fasten the seat belt. The natural process of aging may involve a decline in muscle strength and endurance, flexibility, and joint stability. In addition, osteoarthritis and other musculoskeletal problems are common in older adults. Individuals who suffer pain and limitations from these conditions may not only experience direct effects on their driving ability but also decrease their physical activity, causing further decline in motor function. Fatigue can be an issue for older adults who are driving a long distance, have undiagnosed sleep apnea, or advanced functional loss from severe end organ disease.

Functional Range of Motion: Drivers must be able to steer, use the accelerator and brake pedals, and use the primary and secondary controls of the vehicle (e.g., turn signal, headlights, wipers, climate controls). Range of motion in the neck is essential so that the driver can turn his or her head quickly to check the blind spot; however, resources are available to compensate for this functional limitation (e.g., backing cameras, fisheye mirrors, panoramic mirrors). Although muscle strength is less of an issue with newer vehicles, older adult drivers should have functional range of motion that permits reaching for pedals and the steering wheel with little or no pain.

Proprioception: Drivers must have the ability to know whether their foot is on the brake or accelerator pedal. The underlying issues with “pedal confusion” are not clear. For older adult drivers, the problem may possibly be with proprioception. It would be easy for a driver to become confused if he or she had to “look” to see where his or her foot was in order to drive. Clearly, older adult drivers with sensory issues such as diabetic neuropathy would benefit from a test of leg and foot proprioception.

Refusal of Assessment

Older adult drivers and their caregivers may express fear, resistance, or refusal to participate in screening or assessment of functional abilities. The three most common reasons are the older adult’s belief that he or she is a good driver, there is fear the outcome may put the older adult’s license at risk, and/or the older adult and/or caregiver has impaired insight. Caregivers may have conflicting priorities when trying to balance their respect for the older driver’s wishes, level of risk, and the caregiver burden that cessation of driving can create, including responsibility in time or money for transporting the older adult to appointments and activities.

In these situations, it may be helpful to assure the older adult that the concern and focus is on prevention and optimizing driving ability and not on removing the ability to drive. Health care providers, considering clinical observations and using best judgment, may decide there is cause for concern but not an immediate risk. The goal might be to initiate a conversation with the older adult and ideally with the caregiver about driving safety. It will be important to discuss, with permission, the medical condition(s) of the older adult and the potential impact these can have on driving safety. The first steps may focus on increasing self-awareness and a shared understanding of driving risk for self and others. In addition, providers should ensure that the older adult understands that the goal is to work together to find solutions for him or her to continue driving if at all possible. It is well established that most older adults, regardless of age, intend to continue driving until they decide “I have become an unsafe driver.”²⁹ Older adults who live in rural communities may realize they are at risk but do not feel they have any other option. Focusing on counseling and referral on alternative transportation options first may allow older adults to consider assessment at a later point in time.

For some older adults, it may be evident that further evaluation is necessary. In these cases, professional ethics should be used to guide the decision. Maybe the clinical team member can

work with the older adult to follow a course of stopping driving now until “we better understand your situation, gain the information required through evaluation, and then determine the appropriate plan of care.” This message is about safety and support, both offering the older adult and the family time to consider the consequences and prepare them for next steps. If the older adult appears to have deficits in the functional areas and he or she or caregivers report problems in other complex tasks (e.g., finances, cooking, shopping), referral to an occupational therapist may be more appropriate. As a service usually covered by medical insurance plans, a full assessment of underlying functions as well as other complex tasks can lead to interventions that may improve function before a specialized assessment of driving.

Alternatively, if the older adult appears to have problems only in regard to driving, and not with other areas of daily living, a referral to a driver rehabilitation specialist is prudent (see Chapter 5). The driver rehabilitation specialist will conduct a comprehensive driving evaluation that includes a complete clinical assessment covering the areas of vision, perception, cognition, and motor as well as an on-road assessment, if warranted.

Some older adults will absolutely refuse to consider evaluation and are intent on continuing to drive. For these individuals, insight into deficits may be a problem. A discussion with a caregiver may offer more information as well as provide additional support for pursuing an evaluation. Actions should be guided by professional ethics, and it may be necessary to report the older adult to the appropriate driving licensing agency (see Chapters 7 and 8).

Self-Assessment Tools

Many self-screening and caregiver rating tools are available to assist in building awareness of the changes associated with aging as well as the symptoms of conditions that affect driving. Following up with the older driver after use of these tools may improve their willingness to be formally assessed by the clinical team. Regardless, it is important to understand that use of these tools do not replace screening performed by professionals.

- *Am I a Safe Driver?* (a one-page handout, see Appendix B)
- The *Driving Decisions Workbook*, developed by the University of Michigan Transportation Research Institute, is a free self-assessment tool with evidence that the workbook scores are positively correlated with on-road driving scores and several clinical tests of functional ability. Both online and print versions are available. Individualized feedback is provided to respondents based on how they answer questions. The workbook can be downloaded at <http://deepblue.lib.umich.edu/bitstream/handle/2027.42/1321/94135.0001.001.pdf?sequence=2&isAllowed=y>.
- The *Fitness to Drive Screening Measure*, developed by the University of Florida, is a free web-based tool for caregivers of older adults to identify at-risk older drivers. The user needs to have driven with the driver in the last 3 months and then rates the driver on 54

driving skills. A rating profile of the driver is available and includes a classification of the driver into one of three categories (at-risk driver, routine driver, or accomplished driver) with recommendations given as follow-up steps. Research has shown that feedback from the web site correlates positively with driving risk. This tool is available at <http://fitnesstodrive.phhp.ufl.edu/>.

- The *SAFER Driving Survey*, developed at the University of Michigan Transportation Research Institute, is a web-based tool (available at <http://um-saferdriving.org>) that asks users about the severity of health concerns they are experiencing due to medical conditions and medications. The website then calculates the effects of these health concerns on critical driving skills and gives users individualized feedback on (1) how their driving may be declining, (2) what to do to continue driving safely given these declines, and (3) possible recommendations for more in-depth assessment. Research has shown that feedback from the web site correlates positively with on-road driving scores and an assessment from an occupational therapist. Users also report that the site is easy to use, the information is helpful, and that they discovered declines in themselves of which they were not previously aware.³⁰
- *Roadwise Review* is an online assessment (available at www.aaafoundation.org/-roadwise-review-online; CD also available) from the American Automobile Association that instructs older adults in real time on the completion of several tests of important functional abilities for driving. It then provides feedback on the presence of impairment. Roadwise Review requires the older adult to use a computer and presence of an assistant during the assessment.

Clinical Team Assessment Tools

Assessments range from simple paper and pencil tools performed by clinicians in their offices to complex assessments that may be only in the scope of practice of neuropsychologist (e.g., Rey Figure) or driver rehabilitation specialist (e.g., comprehensive driving evaluation with on-road assessment).

For the clinical team member who is screening or assessing an older driver, the following summary describes a toolbox of practical, office-based functional assessment tools in the major areas of vision, cognition, and motor/sensory function related to driving, the Clinical Assessment of Driving Related Skills (CADReS). Clinical team members should choose the tool in each area that best fits the practice setting in which they care for older adults and document their encounters.

In the case of cognitive assessments, it is not always necessary to do all the tests. Depending on the outcome of the easiest tests, it may be unnecessary to progress further.

General

- Driving history: A brief driving history can be useful as an initial screen to identify the older adult's perception of his or her driving as well that of a caregiver if available. Recent traffic violations, crashes (including unreported), or near misses are all red flags for concern (see Chapter 2). The *Driving Habits Questionnaire* is available³¹ but is lengthy. A modified version is available in Appendix C.
- IADLs questionnaire: A checklist of other IADLs can also be used as an initial screen to identify if the older adult is having difficulties with other complex tasks of daily living. As an IADL, driving uses underlying functions (e.g., visual processing, executive functioning, memory), similar to financial management, shopping, or cooking. If the older adult is having difficulty with those tasks, further screening or assessment is warranted. A report from a caregiver may also be helpful when the older adult appears to have cognitive impairment.
- Medication change: Certain medications clearly affect driving, and new or changing doses may affect assessment findings, perhaps triggering red flags that are temporary.

Vision

- Visual acuity: Measured by vision charts, visual acuity should be measured because it is the legal criteria for most State licensing agencies. The Snellen chart is described below and provided in Appendix C.
- Visual fields: Using a uniform manner of testing as described below, visual fields can be assessed.
- Contrast sensitivity: Many charts are commercially available (e.g., Pelli-Robson contrast sensitivity chart) to test the ability to perceive objects in contrast to the environment.

Cognitive

- Montreal Cognitive Assessment (MoCA [www.mocatest.org/]): The MoCA is a brief cognitive test designed to assist health care professionals in detecting mild cognitive impairment. It may be administered by anyone, but the results should only be interpreted by an individual with expertise in the cognitive field.³² It rates cognitive performance, is available in multiple languages, and has been validated for adults 55 to 85 years old. It tests memory, attention, language, abstract, recall, orientation, as well as visuospatial skills by incorporating a shorter Trails B and a clock-making task.
- Trails B: This test of general cognitive function also specifically assesses working memory, visual processing, visuospatial skills, selective and divided attention, and psychomotor coordination. Numerous studies have demonstrated an association between poor performance on the Trail-Making Test Part B and poor driving performance³³ (see below for directions and form). Neuropsychologists often recommend giving the Trails A test (connecting just numbers) before giving the Trails B

test. The rationale is two-fold: The Trails A provides an appropriate warm-up to Trails B, and allows the older adult some practice on a simpler concept, and, in many of the driving studies that validated Trails B, the Trails A was given first.

- Clock-Drawing Test: This test may assess long-term memory, short-term memory, visual perception, visuospatial skills, selective attention, abstract thinking, and executive skills. Preliminary research indicates an association between specific scoring elements of the clock-drawing test and poor driving performance.³⁴
- Maze test: There are several versions of maze testing, including online versions. Depending on the type of test, it assesses visual perception, visuospatial skills, abstract thinking, and executive skills. The Snellgrove maze³⁵ is a one-page cognitive screen for driving competence that was validated with older adults with mild cognitive impairment or early dementia.

Motor/Sensory

- Rapid Pace Walk and Get Up and Go: These tests are measures of lower limb strength, endurance, range of motion, and balance. The Rapid Pace Walk has been linked with driving outcomes,^{9,36} whereas Get Up and Go³⁷ has been more closely linked with falls and future disability and long term care placement. Because falls have been associated with poor driving outcomes, either of these tests would be appropriate measures for assessing overall motor abilities. For directions, see below.
- Range of Motion: Performing a functional range of motion test is important for examining if and how the motor vehicle can be adapted to meet limitations of the older adult. Mirrors and education/training can accommodate limitations of the neck. Limitations in any of the extremities can be accommodated by adaptive equipment recommended by driver rehabilitation specialists. For directions for a functional range of motion test, see below.

The Evolution of Computer-Based Tools

Three computer-based assessment tools are commercially available. The cost of these tools is presently not covered by most insurance products. In general, more research is needed on these computer-based assessments before they can be used as tools for making licensing decisions. The use of interactive driving simulators is also being studied, with emerging evidence supportive for their use as a potential assessment tool.

- Useful Field of View: This is the most widely studied instrument for detection of impairment in processing speed, divided attention, and selective attention that has been moderately correlated with crash risk in older adult drivers. The strongest evidence is for the Subtest 2, which tests processing speed,^{9,14,35,38} but not all studies supported the predictive validity of this instrument.^{8,39} This assessment tool is available for purchase (information is available on the Visual Awareness web site (www.visualawareness.com/Pages/whatis.html)).⁴⁰ Cost, time, and ability to bill, as well

as limited studies in a primary care setting, might be potential barriers to utilization.

- Driving Health Inventory (DHI).⁴¹ This computerized set of tests that assess key functional abilities for driving was developed using data from individual assessments in the Maryland Pilot Older Driver Study. It is intended for use by health care professionals to assess older adults,³⁶ but individual users may download single-use licenses for personal use. Because each component was studied separately and the older adults studied were a low-risk general population low risk, there is not strong evidence for the DHI as a whole, linking the final version of the DHI with fitness to drive. The DHI did appear to discriminate between drivers with a history of a crash and those without crashes in a small cohort of drivers. In addition, this battery of tests appears feasible and acceptable to older drivers as a screen for functional impairments.³⁹ This assessment tool is available for purchase (information is available on the DrivingHealth website <http://drivinghealth.com/screeningassessment.html>). Again, cost, time, and ability to bill are potential barriers to utilization.
- DriveABLE: This assessment is only of cognitive abilities for driving; it is computer-based and electronically scored (available at www.driveable.com/). Based on the performance of the older adult, results are generated from a computer algorithm that returns a score between 1 and 99 and reflects the “Predicted Probability of Failing an On-Road Evaluation,” with 1 being least likely and 99 being most likely to fail. The computer program designates upper and lower areas of risk. The developers of the program maintain that computer knowledge or familiarity with a computer does not affect performance and that the computer presentation of the tasks enables precision measurements and objectivity and removes testing bias. However, there is minimal independent research evidence using DriveABLE that supports the claims of predicting driving risk accurately and this approach does not provide the clinician with information which can be used to identify clinical solutions for potential problems. Older adults who score in the middle of the range may require further evaluation such as on-road assessment, reliance on caregiver information, recent driving history, or further in-office testing.

Assessment Tool Performance Instructions

Snellen E chart

The Snellen chart is used to test far visual acuity. The standard chart measures 9” x 23” and is printed on a durable, tear-resistant latex sheet, with eyelets for easy hanging. Letters are printed on one side, and tumbling “E” symbols are printed on the reverse.

This test is best performed in a hallway with good lighting. Tape can be used to mark a distance of 20 feet.

With the chart hanging on a wall, the older adult is instructed to stand 20 feet away. Wearing his or her usual glasses or contact lenses, the individual reads the smallest line possible with both eyes open. Visual acuity is based on the lowest full row that he or she successfully reads, and the process is repeated for each eye individually. However, if the best the individual can see in either eye is 20/40, then his or her acuity is considered to be 20/40 in both eyes.

Far visual acuity can also be measured using another chart per the clinician's preference, such as the Snellen chart for a 10-foot distance or the Sloan low-vision letter chart for 6 meters (20 feet).⁴²

Near visual acuity can be tested with commercially available charts and should be considered whenever an older adult complains of difficulty seeing/reading maps or gauges and controls within the vehicle. This can be checked using a Rosenbaum pocket chart.

Some limitations have been noted in testing using the Snellen chart. These include, but are not limited to, the different number of letters per line, different spacing between lines, the specific use of letters, and the spacing between letters.⁴³ A trend in the field of eye care has been to use a newer chart called the Early Treatment Diabetic Retinopathy Study (ETDRS) that in some studies of eye diseases appears to be more accurate.⁴⁴ The ETDRS chart improves on the Snellen test by having a similar number of letters per line and standard spacing between the letters.

Visual Fields

The examiner sits or stands 3 feet in front of the patient, at the individual's eye level. The patient is asked to close his or her right eye, while the examiner closes his or her left eye. Each fixes on the other's nose.

The examiner then holds up a hand in each visual field simultaneously, with a random number (usually one or two) of fingers in each of the four quadrants, and asks the patient to state the total number of fingers. With the fingers held slightly closer to the examiner, the patient has a wider field of view than the examiner. Provided that the examiner's visual fields are within normal limits, if the examiner can see the fingers, then the patient should be able to see them unless he or she has a visual field defect.

The process is repeated for the other eye (patient's left eye and examiner's right eye closed). The examiner indicates any visual field defects by shading in the area of defect on a visual field representation.

Rapid Pace Walk

A 10-foot path is marked on the floor with tape. The individual is asked to walk the 10-foot path, turn around, and walk back to the starting point as quickly as possible. If the older adult normally walks with a walker or cane, he or she may use it during this test. The total walking distance is 20 feet.

The examiner begins timing the individual when he or she picks up the first foot, and stops timing when the last foot crosses the finish mark. This test is scored by the total number of seconds it takes for the older adult to walk 10 feet and back.⁴²

In addition, the examiner should indicate on the scoring sheet whether the older adult used a walker or cane. Scores longer than 9 seconds are associated with an increased risk of at-fault motor vehicle tasks.³³

Get Up and Go

Instructions³⁷

Ask the patient to perform the following series of maneuvers.

1. Sit comfortably in a straight-backed chair.
2. Rise from the chair.
3. Stand still momentarily.
4. Walk a short distance (approximately 10 feet/3 meters).
5. Turn around.
6. Walk back to the chair.
7. Turn around.
8. Sit down in the chair.

Scoring

Observe the patient's movements for any deviation from a confident, normal performance. Use the following scale.

- 1 = Normal
- 2 = Very slightly abnormal
- 3 = Mildly abnormal
- 4 = Moderately abnormal
- 5 = Severely abnormal

"Normal" indicates that the patient gave no evidence of being at risk of falling during the test or at any other time. "Severely abnormal" indicates that the patient appeared at risk of falling during the test. Intermediate grades reflect the presence of any of the following as indicators of the possibility of falling: undue slowness, hesitancy, abnormal movements of the trunk or upper limbs, staggering, or stumbling.

A patient with a score of 3 or more on the Get Up and Go Test is at risk of falling.

Functional Range of Motion

To test the functional range of motion for an older adult, ask him or her to perform the below listed motions bilaterally.

- Neck rotation: “Look over your shoulder like you’re backing up or parking. Now do the same thing for the other side.”
- Shoulder and elbow flexion: “Pretend you’re holding a steering wheel. Now pretend to make a wide right turn, then a wide left turn.”
- Finger curl: “Make a fist with both of your hands.”
- Ankle plantar flexion: “Pretend you’re stepping on the gas pedal. Now do the same for the other foot.”
- Ankle dorsiflexion: “Point your toes toward your body.”

The test is scored by evaluating the motion as either within normal limits or not within normal limits. The latter means that range of motion is done with excessive hesitation, pain, or very limited range of motion.

Maze Test

The Maze Test was developed as a pencil and paper test of attention, visuoconstructional ability, and executive functions of planning and foresight. The participants compete a simple demonstration maze first in order to establish the rule set, then complete the Maze Task. Performance is measured in time (in seconds), using a stop watch, and the total number of errors. Errors are determined by the number of times the participant enters a dead-end or fails to stay in the lines. Time to administer is 1–4 minutes. The Maze Test is in Appendix C; it should be printed on an 8 × 11” paper with the Maze Test at least 5.5” square and the practice 4.5”.

The Maze Test is placed in front of the participant, and the examiner states, “I’m going to time you as you find the route from the start to the exit of the maze. Put your pen here at the start (point to the start). Here is the exit of the maze (point to the exit). Draw a line representing the route from the start to the exit of the maze. Don’t run into any dead ends (point to a dead end) or cross any solid lines (point to a solid line). Go!” The instructions can be repeated, and the administrator should correct any rule breaks. There is a limit of 3 minutes for the Maze Test. If the maze has not been completed in this time, discontinue.

Montreal Cognitive Assessment (MoCA)

The MoCA is designed as a rapid screening tool that measures attention and concentration, executive functions, memory, language, visuoconstructional skills, conceptual thinking, calculations, and orientation. Time to administrator is about 10 minutes.

The highest possible score is 30, with a score of 26 or above considered normal. One point should be added for individuals with 12 years or fewer of formal education. A score of 18 or less should raise concerns about driving safety.

The original version and directions are in Appendix C.

Trail-Making Test, Part B

This test of general cognitive function specifically assesses working memory, visual processing, visuospatial skills, selective and divided attention, and psychomotor coordination. In addition, numerous studies have demonstrated an association between poor performance on the Trail-Making Test, Part B, and poor driving performance.³⁶

Part B involves connecting, in alternating order, encircled numbers (1–13) and encircled letters (A–L) randomly arranged on a page. This test is scored by overall time (seconds) required to complete the connections accurately. The examiner points out and corrects mistakes as they occur; the effect of mistakes, then, is to increase the time required to complete the test. This test usually takes 3–4 minutes to administer.

The examiner administers the test to the individual, stating, “Now I will give you a paper and pencil. The numbers 1 through 13 and the letters A through L are scattered across the page. Starting with 1, draw a line to A, then to 2, then to B, and so on, alternating back and forth between numbers and letters until you finish with the number 13. I’ll time how fast you can do this. Are you ready? Go.” The examiner records the time to complete.⁴²

Clock-Drawing Test

In this form of the clock-drawing test, the examiner gives the individual a pencil and a blank sheet of paper and says, “I would like you to draw a clock on this sheet of paper. Please draw the face of the clock, put in all the numbers, and set the time to ten minutes after eleven.” This is not a timed test, but the individual should be given a reasonable amount of time to complete the drawing. The examiner scores the test by examining the drawing for each of seven specific elements found on the CADReS score sheet (see Appendix C for score sheet).

Test Sequence

Although these tests may be administered in any order, the following sequence is recommended: (Note that the MoCA incorporates the Trail-Making Part B, and Clock Drawing).

1. Visual fields by confrontation testing
2. Snellen E Chart
3. Rapid Pace Walk and/or Get Up and Go
4. Functional Range of Motion
5. Maze Test
6. Montreal Cognitive Assessment (MoCA)
7. Trail-Making Test, Part A and then Part B
8. Clock-Drawing Test

For a discussion of scoring these tests and recommended interventions based on performance, see Chapter 4.

References

1. Foley, D. J., Heimovitz, H. K., Guralnik, J. M., & Brock, D. B. (2002, August). Driving life expectancy of persons aged 70 years and older in the United States. *American Journal of Public Health, 92*, 8, 1282-9.
2. Transportation Research Board. (in press). A Taxonomy and Terms for Stakeholders in Senior Mobility. Washington, DC: Author.
3. Dickerson, A. E. (2013). Driving assessment tools used by driver rehabilitation specialists: survey of use and implications for practice. *American Journal of Occupational Therapy, 67*, 564–573.
4. Dickerson, A. E., Brown, D., Ridenour, C. (2014). The predictive validity of screening and assessment tools for driving: a systematic review. *American Journal of Occupational Therapy, 68*, 670–680.
5. Bédard, M., & Dickerson, A. E. National Highway Traffic Safety Administration, & American Occupational Therapy Association. (2014). Consensus statements for screening and assessment tools. *Occupational Therapy Health Care, 28*(2), 127–131. doi: 10.3109/07380577.2014.903017.
6. Bédard, M., Weaver, B., Darzins, P., & Porter, M. M. (2008). Predicting driving performance in older adults: We are not there yet! *Traffic Injury Prevention, 9*(4), 336–341.
7. Baldock, M.R. J., Mathias J., McLean J., & Berndt, A. (2007). Visual attention as a predictor of on-road driving performance of older drivers. *Australian Journal of Psychology, 59*, 159–168.
8. Carr, D. B., Barco P. P., Wallendorf, M., J., et al. (2011). Predicting road test performance in drivers with dementia. *Journal of the American Geriatrics Society, 59*, 2112–2117.
9. Classen, S., Witter D. P., Lanford D. N., Okun, M. S., Rodriguez, R. L., Romrell, J., ..., Fernandez, H. H. (2011). Usefulness of screening tools for predicting driving performance in people with Parkinson's disease. *American Journal of Occupational Therapy, 65*, 579–588.
10. Shinar, D., & Schieber, F. (1991). Visual requirements for safety and mobility of older drivers. *Human Factors, 33*(5), 507–519.
11. Carr, D. B. (1993). Assessing older drivers for physical and cognitive impairment. *Geriatrics, 48*(5), 46–51.

12. Munro, C. A., Jefferys, J., Gower, E. W., Munoz, B. E., Lyketsos, C. G., Keay, L., ... Bandeen-Roche, K. (2010). Predictors of lane-change errors in older drivers. *Journal of the American Geriatrics Society*, 58, 457–464.
13. Uc, E. Y., Rizzo. M., Johnson, A., . M., Dastrup, E., Anderson, S. W., & Dawson, J. D. (2009). Road safety in drivers with Parkinson disease. *Neurology*, 73, 2112–2119.
14. Wood, J. M., Anstey, K., J., Kerr, G. K., Lacherez, P. F., & Lord, S. (2008). A multidomain approach for predicting older driver safety under in-traffic road conditions. *Journal of the American Geriatrics Society*, 56, 986–993.
15. McGwin, G. Jr., Sarrels, S. A., Griffin, R., Owsley, C., & Rue, L. W. 3rd. (2008, November). The impact of a vision screening law on older driver fatality rates. *Archives of Ophthalmology*, 126(11), 1544-7
16. Menemeyer, S. T., Owsley, C., & McGwin, G. Jr. (2013). Reducing older driver motor vehicle collisions via earlier cataract surgery. *Accident Analysis & Prevention*, 61, 203–211.
17. Wood, J. M., & Carberry, T. P. (2006). Bilateral cataract surgery and driving performance. *British Journal of Ophthalmology*, 90(10), 1277-1280.
18. Owsley, C., McGwin, G. Jr., Sloane, M., Wells, J., Stalvey, B. T., & Gauthreaux, S. (2002). Impact of cataract surgery on motor vehicle crash involvement by older adults. *Journal of the American Medical Association*, 288(7), 841-289.
19. Dobbs, B. M. (2002, February). Medical Conditions and Driving: Current Knowledge. (NHTSA Contract Number DTNH22-94-G-05297) . Barrington, IL: Association for the Advancement of Automotive Medicine.
20. Owsley, C., & Ball, K. (1993). Assessing visual function in the older driver. *Clinics in Geriatric Medicine*, 9(2), 389–401.
21. Classen, S., Dickerson, A. E., & Justiss, M. (2012). Occupational Therapy Driving Evaluation: Using Evidence-Based Screening and Assessment Tools. In: M. J. Maguire & E. Schold Davis (eds.), *Driving and Community Mobility: Occupational Therapy Strategies Across the Lifespan*. Bethesda, MD: AOTA Press.
22. Colsher, P. L., & Wallace, R. B. (1993). Geriatric assessment and driver functioning. *Clinics in Geriatric Medicine*, 9(2), 365–375.
23. Goetz, C. G. (1999). *Textbook of Clinical Neurology*, 1st ed. Philadelphia: W. B. Saunders Company.

24. Beers, M. H., & Berkow, R. (eds). (2000). Aging and mental health. In: *The Merck Manual of Geriatrics*. Whitehouse Station, NJ: Merck & Co., Inc.
25. Hartley, A. A. (1992). Attention. In F. I. M. Craik & T. A. Salthouse (eds). *The Handbook of Aging and Cognition*. Hillsdale, NJ: Erlbaum.
26. Madden D. J., Turkington T. G., Provenzale, J. M., Hawk, T. C., Hoffman, J. M., & Coleman, R. E. (1997). Selective and divided visual attention: age-related changes in regional cerebral blood flow measured by H215O PET. *Human Brain Mapping*, 5, 389–409.
27. Elliot, R. (2003). Executive functioning and their disorders. *British Medical Bulletin*, 65, 49–59.
28. Barkley, R. A. (2012). *Executive Functions: What They Are, How They Work, and Why They Evolved*. New York: Guilford Publications, Inc.
29. D'Ambrosio, L. A., Coughlin, J. F., Pratt, M. R., & Mohyde, M. (2012). The continuing and growing importance of mobility. In: J. Coughlin & L. A. D'Ambrosio, (eds.), *Aging America and Transportation: Personal Choices and Public Policy*. New York: Springer Publishing Co.
30. Eby, D. W., Molnar, L. J., Shope J. T., & Dellinger, A. M. (2007). Development and pilot testing of an assessment battery for older drivers. *Journal of Safety Research*, 38, 535–543.
31. Owsley, C., Stalvey, B., Wells, J., & Sloane, M. E. (1999). Older drivers and cataracts: Driving habits and crash risk. *The Journals of Gerontology, Series A: Biological Science and Medical Science*, 54A, M203–M211.
32. Nasredinne, Z. (2007). Frequently Asked Questions. (Web page). Retrieved from the MOCA web site at www.mocatest.org/fag/
33. Staplin, L., Gish, K., . W., & Wagner, E., K. (2003). MaryPODS revisited: updated crash analysis and implications for screening program implementation. *Journal of Safety Research*, 34, 389–397
34. Freund, B., Gravenstein, S., & Ferris, R. (2002). Use of the clock drawing test as a screen for driving competency in older adults. Presented at the American Geriatrics Society Annual Meeting, Washington, DC, May 9, 2002.
35. Snellgrove, C. A. (2005). Cognitive screening for the safe driving competence of older people with mild cognitive impairment or early dementia. Canberra, AU: Australian Transport Safety Bureau.

36. Edwards, J. D., Leonard, K., . M., Lunsman, M., Dodson, J., Bradley, S., Myers, C. A., & Hubble, B. (2008). Acceptability and validity of older driver screening with the Driving Health Inventory. *Accident Analysis & Prevention*, 40, 1157–1163.
37. Mathias, S., Nayak, U. S. L., & Isaacs, B. (1986). Balance in elderly patients: the “get-up and go” test. *Archives of Physical Medicine and Rehabilitation*, 67, 387-389.
38. Classen, S., McCarthy D. P., Shechtman, O., Awadzi, K. D., Lanford, D. N., Okun, M. S., ... Fernandez, H. H. (2009). Useful field of view as a reliable screening measure of driving performance in people with Parkinson's disease: results of a pilot study. *Traffic Injury Prevention*, 10, 593–598.
39. Weaver, B., Bédard. M., McAuliffe, J., & Parkkari, M. (2009). Using the Attention Network Test to predict driving test scores. *Accident Analysis & Prevention*, 41, 76–83.
40. Visual Awareness Research Group, Inc. What Is UFOV? A Breakthrough In Cognitive Assessment and Rehabilitation (Web page). Retrieved from the Visual Awareness website at www.visualawareness.com/Pages/whatis.html
41. TransAnalytics Health & Safety Services. (2015). [Driving Health Inventory] and UFOV (Web page). Retrieved from the TransAnalytics website at <http://drivinghealth.com/screeningassessment.html>
42. Staplin, L., Lococo, K. H., Stewart J., & Decina, L. E. (1999, April). Safe Mobility for Older People Notebook (Report No. DOT HS 808 853). Washington, DC: National Highway Traffic Safety Administration.
43. VectorVision. (2015). ETDRS Acuity (Web page). Retrieved from the VectorVision website at www.vectorvision.com/html/educationETDRSAcuity.html
44. Falkenstein, I. A., Cochran, D. E., Azen, S. P., Dustin, L., Tammewar, A.M., Kozak, I., & Freeman, W. R. Comparison of visual acuity in macular degeneration patients measured with Snellen and early treatment diabetic retinopathy study charts. *Ophthalmology*, 115(2), 319–323.

CHAPTER 4 CLINICAL INTERVENTIONS

Key Points

- The goal of clinical evaluation is to identify, correct, or stabilize any functional deficits that may impair the older adult's driving performance and to consider referral to a driver rehabilitation specialist (DRS), if appropriate
- Screening for visual field cuts is important, because most older adults with visual field loss are unaware of the deficit until it becomes quite significant.
- Failure to pass any measure of cognition in the Clinical Assessment of Driver-Related Skills (CADReS) toolbox should elicit a referral to provide opportunities for older adults to optimize cognitive function and perhaps explore their potential to continue to drive safely. Local resources will vary and may include occupational therapy, speech-language pathologists, neuropsychologists, driving rehabilitation specialists, or other medical specialists.
- If the only problems are with motor and/or somatosensory areas, these individuals should be referred to a DRS to take advantage of advancements in technology and possible adaptive equipment for the vehicle.

Despite encouragement, Mr. Phillips (introduced in previous chapters) hesitates to go through the assessment tools you recommend from the Clinical Assessment of Driver Related Skills (CADReS) toolbox. He states, "I don't see the need for it." You discuss your concerns for his safety and explain how to access NHTSA's Driving Safely While Aging Gracefully online self-assessment as well as provide a copy of the Am I a Safe Driver? handout to take home (www.nhtsa.gov/people/injury/olddrive/Driving%20Safely%20Aging%20Web/index.html). You also counsel Mr. Phillips using The Hartford's We Need to Talk brochure (www.thehartford.com/mature-market-excellence/family-conversations-with-older-drivers). Mr. Phillips agrees to allow his son to observe his driving, and you advise the son on how to access the online Fitness-to-Drive screening measure (<http://ftds.phhp.ufl.edu/>) as well as a print copy of NHTSA's How to Understand & Influence Older Drivers (or the How to Assist the Older Driver handout (see Appendix B).

You document all of this in Mr. Phillips' record and schedule a follow-up appointment. At Mr. Phillips' next visit, you ask him if he has had a chance to review the materials provided on his last visit. He admits that he had another close call while driving, and his son states he observed several driving errors, including turning left in front of an oncoming vehicle. These events have motivated Mr. Phillips to complete the self-assessment. He believes the self-assessment recommendation for further evaluation is a reasonable idea and is now willing to be assessed. From the CADReS toolbox, Mr. Phillips takes 11 seconds to perform the Rapid Pace Walk. His visual acuity is 20/50 on the right and 20/70 on the left. He has limited range of motion on neck rotation, but his ankle plantar flexion and dorsiflexion are within normal limits. It takes him 182

seconds to complete the Trail-Making Test, Part B, and his clock-drawing test is scored as “normal” for all seven criteria.

Now that Mr. Phillips has been assessed, what does his performance indicate? This chapter provides information to support interpretation of CADReS assessment outcomes. However, recommendations stated here are subject to individual State reporting laws and State licensing agency requirements. Links to individual State requirements are provided in chapter 8. Examples of interventions that may help manage and treat any functional deficits identified through CADReS are also provided.

Remember that the goal of clinical evaluation is to identify, correct, or stabilize any functional deficits that may impair the older adult’s driving performance and to refer to a DRS, if appropriate (see Chapter 5). Contributing medical conditions, and potential medication effects as discussed in the Beers criteria¹ are discussed further in chapter 9.

The Clinical Assessment of Driver-Related Skills (CADReS)

Motor and sensory ability, vision and cognition are all important for driving. However, they may not be equally important for a particular older adult. Depending on the older adult’s medical conditions, one area of function may warrant greater attention than another. Depending on the assessment outcome in each area, the outcome action may be different.

Vision

Screening for visual field cuts is important, because most older adults with visual field loss are unaware of the deficit until it becomes quite significant, especially if their medical condition warrants examination (e.g., stroke, macular degeneration). In most cases, referral to an eye specialist is the best outcome if there is any cause for concern.

Contrast sensitivity is a good screen for all older adults, followed by providing appropriate education and information to the older adult driver and caregiver on how to compensate for a deficit. A problem solely with contrast sensitivity does not merit a report to the State licensing agency.

Visual Acuity: Although many States currently require far visual acuity of 20/40 for an unrestricted license, there is little evidence that links static visual acuity to crash risk. In fact, studies undertaken in some States have demonstrated that there is no increased crash risk between 20/40 and 20/70, resulting in several new State requirements.² However, some studies have found that States that require visual testing for license renewal for older adults have lower crash rates.^{3,4}

General recommendations on visual acuity and driving are given below, but note that they are subject to each State’s licensing requirements.

For corrected visual acuity worse than 20/40 (i.e., more impaired), the clinical team member should:

- Refer to a vision specialist (ophthalmologist or optometrist) for diagnosis and treatment (if possible) of the underlying cause of vision loss. The older adult should obtain and use the appropriate glasses or contact lenses. If the older adult is not currently under the care of a specialist, referral is recommended.
- Recommend that the older adult reduce the impact of decreased visual acuity by restricting travel to low-risk areas and conditions (e.g., familiar surroundings, non-rush hour traffic, low speed areas, daytime, and good weather conditions). We recognize that the evidenced-based literature on restriction is equivocal, but still believe this to be good practice.
- Be aware that the older adult may require more frequent (e.g., yearly) assessment of visual acuity to detect further visual decline caused by chronic, progressive diseases such as age-related macular degeneration and glaucoma.

For corrected visual acuity worse than 20/100 (i.e., more impaired), the clinical team member should:

- Follow the recommendations above.
- Recommend that the older adult not drive unless safe driving ability can be demonstrated in an on-road assessment performed by a DRS, where permitted and available. Check to see if low-vision driving rehabilitation is available in your area.

Visual Fields and Contrast Sensitivity: Research shows that visual field loss can significantly affect driving safety. In a study of 10,000 volunteer California license applicants, visual fields deteriorated significantly among drivers >60 years old. In addition, drivers with binocular visual field loss had driving crash and conviction rates more than twice as high as age- and gender-matched drivers with normal visual fields.⁵ In another study, most drivers with moderate binocular visual field loss (i.e., horizontal field ranging from 78 to 165 degrees) displayed acceptable on-road driving skills.⁶ Recently, in studies focused on a more homogeneous group of older adults with a specific condition known to impair visual fields (e.g., glaucoma), increased crash risk was correlated with moderate to severe field defects.^{7,8}

Although an adequate visual field is important for safe driving, there is no conclusive evidence to define “adequate.” Most likely, this varies widely from person to person and may depend on the presence of other comorbidities. For example, a driver with a restricted visual field but excellent scanning ability may drive as safely as a driver with an unrestricted visual field but poor neck rotation.⁹ Screening for visual field cuts is important, because most older adults with visual field loss are unaware of the deficit until it becomes quite significant, especially if their medical condition warrants examination (e.g., stroke, macular degeneration).

General recommendations on visual field and driving are stated below. Physicians and other clinical team members should be aware of and adhere to their States’ specific visual field requirements.

For visual field defects noted on confrontation testing, the clinical team member should:

- Refer to a vision specialist (ophthalmologist or optometrist) for diagnosis and treatment (if possible) of the underlying cause of vision loss. In addition, automated visual field testing may help define the extent of the defect; ophthalmologists have a number of useful instruments for measuring visual fields.
- For older adults with a binocular visual field of questionable adequacy (as deemed by clinical judgment), strongly recommend an on-road assessment performed by a DRS. Through driving rehabilitation, the older adult may learn how to compensate for decreased visual fields. In addition, the DRS may prescribe equipment such as enlarged side- and rear-view mirrors and train the older adult in their use.
- Consider contrast sensitivity testing, which is a good screen for all older adults, followed by providing education and information to both the older adult driver and caregivers on how to compensate for a deficit by minimizing low-light driving conditions (at night, in bad weather). Vision specialist referral is desirable, but a problem solely with contrast sensitivity does not merit a report to the State licensing board.

Visual fields may need to be retested in the future for visual field defects caused by chronic, progressive diseases.

Cognition

Screening for cognitive deficits is essential, along with careful interpretation of the findings. There is clear evidence that the Mini-Mental State Exam is not related to outcomes in crashes or driving abilities.^{10,11} However, the tools recommended in the CADreS have been particularly chosen to provide reasonable information in the office-based setting on skills known to be related to driving. Any cognitive screen that clearly demonstrates the older adult has moderate or severe cognitive impairment is sufficient evidence for a provider to recommend driving cessation.¹² No further referral is necessary for evaluation of driving performance. A referral to a general practice occupational therapist for further evaluation of IADLs or to a neuropsychologist for appropriate testing and diagnosis is warranted and may be an important resource for improving or extending quality of life and safe mobility.

For older adults with mild cognitive impairment or early dementia (with or without motor impairment), more information should be obtained to explore the reversibility of the cognitive impairment, the etiology and the potential and strategies for compensation, if memory loss is not severe. Failure to pass any measure of cognition in the Clinical Assessment of Driver-Related Skills (CADreS) toolbox should elicit a referral to provide opportunities for older adults to optimize cognitive function and perhaps explore their potential to continue to drive safely. Local resources will vary and may include occupational therapy, speech-language pathologists, neuropsychologists, driving rehabilitation specialists, or other medical specialists. Although the following cognitive tests are scored separately, interventions are recommended if the older adult reaches designated cut-off values (as described below) on any of them. Potential

interventions will vary depending on the area of cognitive impairment demonstrated (impulsiveness, judgment, memory, visuospatial, etc.).

Montreal Cognitive Assessment (MoCA): The MoCA was designed as a rapid screening instrument for mild cognitive dysfunction. It assesses different cognitive domains: attention and concentration, executive functions, memory, language, visuoconstructional skills, conceptual thinking, calculations, and orientation. Time to administer the MoCA is approximately 10 minutes. The total possible score is 30 points; a score of 26 or above is considered normal. One point is added for any individual who has 12 years or fewer of formal education.¹³ In individuals with cognitive impairment, there was a significant relationship between MoCA score and on-road outcome. Specifically, an individual was 1.36 times as likely to fail the road test with each 1-point decrease in MoCA score, with a score of 18 or less of concern regarding driving safety.¹⁴ The MoCA is free for public use as it is not copyrighted, and is widely available in multiple languages via their website.

Trail-Making Test, Part B (TMT-B): A time for completion of >3 minutes (>180 seconds) indicates a need for intervention,¹⁵ such as a review of causes for the abnormal result (e.g., dementia, sedating medication, depression), and/or referral to a DRS. Numerous studies have demonstrated an association between performance on the TMT-B and cognitive function and/or driving performance. In a study of 1,700 drivers ≥65 years old who were applying for renewal of their North Carolina driver's licenses, TMT-B test results were strongly associated with recent prior crash involvement.¹⁶ A study of 105 drivers in Nebraska 65 to 88 years old showed that on-road driving performance significantly correlated to TMT-B performance (correlation coefficient -0.42).¹⁷ Further data from the Maryland Pilot Older Driver Study¹⁸ demonstrated a significant correlation between TMT-B performance and future at-fault crash in the license renewal sample.

Clock-Drawing Test, Freund Clock Scoring for Driving Competency: Any incorrect or missing element on the Freund Clock Scoring criteria signals a need for intervention, such as a review of causes for the abnormal result (e.g., dementia) and/or referral to a DRS.

Clock-drawing tests have been found to correlate significantly with traditional cognitive measures and in some studies discriminate healthy individuals from those with dementia.¹⁹ Of all the measures that have been correlated with impaired driving performance in older adults with dementia, tests of visuospatial skill ability have had the highest predictive value.²⁰ Several versions of the clock-drawing test are available, each varying slightly in the method of administration and scoring.²¹ The Freund Clock Scoring is based on seven "principal components" (as outlined on the CADReS Score Sheet in Appendix C) that were derived by analyzing the clock drawings of 88 drivers ≥65 years old against their performance on a driving simulator.²² Errors on these principal components correlated significantly with specific hazardous driving errors, signaling the need for formal driving evaluation.

Maze Test: The Snellgrove Maze Test measures only those skills required for safe driving: attention, visuoconstructional skills, and executive functions of planning and foresight. In a sample of older adults with mild cognitive impairment or early dementia, the Maze Test time

and error scores predicted on-road driving competence with high sensitivity, specificity, and overall accuracy.²³

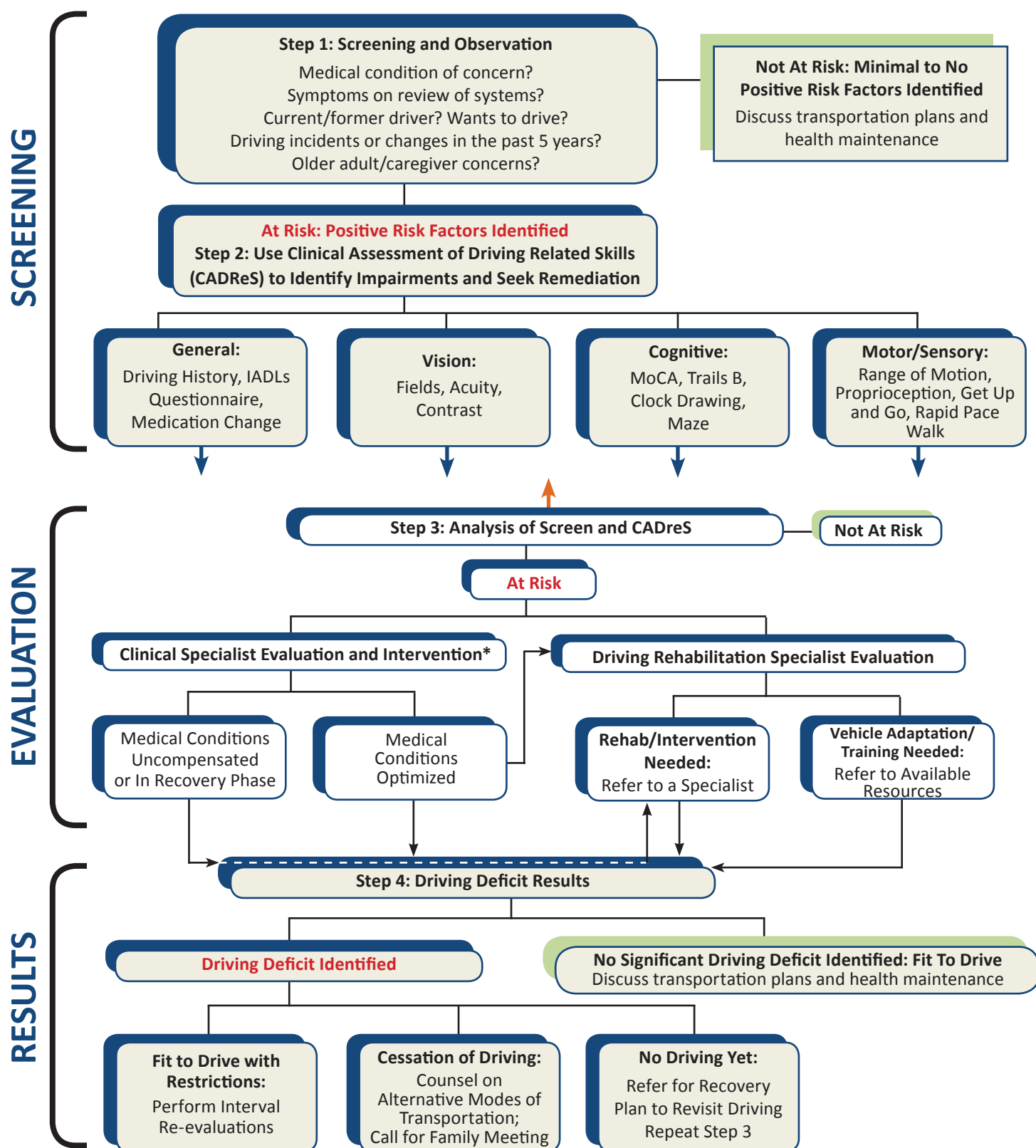
Again, these tests should not be the sole determinant as to whether an older adult should drive.²⁴ However, impairments on these tests are associated with increased risk, and referral for further evaluation, such as performance-based road testing, should be considered. In addition, it is unlikely that future fitness-to-drive evaluations will rely on one test but likely will use a battery of tests such as are currently being tested as part of the CANDRIVE II/Oz Candrive multicenter prospective cohort study or the Rockwood Battery.^{25,26}

If the older adult's performance warrants interventions, the clinician should:

- Gather (or refer for) more information to include detailed history and examination of cognitive and functional abilities, as needed.
- Identify or interview a reliable informant (e.g., family member or caregiver) who can assist with the evaluation.
- Work with the older adult's clinical team for further diagnostic evaluation aimed at identifying the cause of the cognitive decline.
- Evaluate for reversible causes of cognitive decline. Based on history, examination, and cognitive testing, order laboratory tests as needed, including CBC for anemia or infection, comprehensive metabolic profile for electrolyte imbalance and renal function, finger stick for blood sugar, pulse oximetry for hypoxia, TSH for hypothyroidism, liver function tests, vitamin B₁₂ and folate for vitamin deficiency, and based on prior probability, noncontrast CT or MRI scan.
- Screen for depression and treat if positive.²⁷
- Review the older adult's medication regimen and the adverse effects of the medications, and ask the older adult and caregivers about the onset of cognitive decline as related to new medications or dosage changes. Older adults may be unaware of the potential effects of polypharmacy on cognitive ability and driving.
- If possible, treat the underlying disorder and/or adjust the medication regimen as needed. Remember, it is critical that every older adult have a complete evaluation to identify the underlying cause(s) and receive proper treatment.
- If needed, refer the older adult to a neurologist, psychiatrist, or neuropsychologist for additional diagnosis or treatment as needed.
- Recommend a comprehensive driving evaluation performed by a DRS to assess the older adult's performance in the actual driving task. An initial comprehensive on-road assessment with retesting at regular intervals is particularly useful for those with progressive dementing illnesses.
- Strongly recommend that the older adult begin exploring alternative forms of transportation now, and encourage him or her to involve caregivers in these discussions.

See the Plan for Older Drivers' Safety (PODS) diagram on the next page.

Plan for Older Drivers' Safety (PODS)



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

--- Time Lapse

Motor Ability

If the only problems are with motor and/or somatosensory areas, these individuals should be referred to a DRS to take advantage of advancements in technology (see Chapter 5). For older adult drivers who are cognitively intact, learning to compensate for motor and/or somatosensory deficits warrants getting expert advice on strategies, available vehicle adaptations or devices, the type best suited for individual issues, and the training to use them for continued driving. Although the following tests are scored separately, interventions are recommended if the older adult shows significant difficulty as described below on any of the individual tests.

Rapid Pace Walk or the Get Up and Go: Because each of these measure overall lower extremity strength, coordination, and proprioception in a functional task, they also serve to screen how well an older adult can function despite individual motor or range of motion deficits. Older adults with a history of falls have been noted to be at increased risk of motor vehicle crashes.²⁸ A Rapid Pace Walk score >9 seconds should trigger a referral to physical therapy for evaluation and treatment, as well as further evaluation by the clinical team for potential causes and treatments. A score of ≥ 3 on the Get Up and Go test should similarly be considered an indication for referral and treatment. If functional disability is quite severe, it may be wise for the older adult to refrain from driving until such time as their condition can be optimized or adaptive devices (e.g., hand controls) can be installed and the older adult can be trained in their use.

The clinical team member should also be aware that the amount of strength required for safe driving may depend on what vehicle is being driven. For example, an older adult who drives an older car that does not have power steering or who operates a large vehicle (e.g., an RV, which is not uncommon for retirees) may require greater strength to safely drive the vehicle.

Functional Range of Motion: If the older adult's range of motion is not within normal limits (i.e., range of motion is very limited, or good only with excessive hesitation or pain), this may signal the need for intervention. The inability to recognize an object presented directly behind an older adult (e.g., impaired cervical range of motion) has been correlated with increased risk of a motor vehicle crash.¹⁸

Scoring for range of motion is based on simple dichotomous outcomes (normal versus impaired) for several reasons:

- Most clinicians are neither trained in use of goniometers nor have the devices in the office setting.
- Range-of-motion requirements vary with automobile design, and thus it is difficult to specify exact requirements. Vehicle adaptation to compensate is also possible.
- The impact of limited range of motion on driving safety also depends on other functions (as discussed in the visual fields section).

- As with all the other tests from the CADReS toolbox, an older adult's poor performance should be a stimulus for optimization of function rather than for immediate driving restrictions.

If the older adult's performance on this test is not within normal limits, the clinician should be certain to elicit the reason: Do these movements cause muscle or joint pain? Does the older adult complain of tight muscles or stiff joints? Do these movements cause a loss of balance? Knowing the answers to these questions will help in management of the older adult's physical limitations.

If the older adult's performance warrants interventions, the clinical team member should:

- Encourage the older adult to drive a vehicle with power steering and automatic transmission, if he or she does not already do so.
- Recommend that the older adult maintain or begin a consistent regimen of general physical activity, including cardiovascular exercise, strengthening exercises, and stretching. Excellent resources are available through the Go4Life program sponsored by the National Institute on Aging (<https://go4life.nia.nih.gov/>).
- Refer the older adult to a physical therapist as needed for training and exercises to improve strength and/or range of motion, or to an occupational therapist if impairment is affecting daily tasks.
- Check with the older adult's primary care provider on providing effective pain control if pain is limiting range of motion or mobility. This may include prescribing analgesics or medications that treat the underlying disorder (e.g., a urate-lowering drug for gout or L-dopa for Parkinson's disease), or changing the time that the older adult takes pain medications so that relief is achieved before driving. Note that while many analgesics may improve driving through symptom relief, others (including narcotics and skeletal muscle relaxants) have the potential to impair driving ability and may be more deleterious to driving performance than the instigating symptoms. These medications should be avoided, if possible, or prescribed at the lowest effective dose. Older adults should be advised to refrain from driving when first taking these medications until they know whether the medications are tolerated well. Nonsedating and nonpharmacologic strategies for pain management are preferred whenever possible.
- Refer the older adult to a specialist for management of any joint disease, podiatry issues, or neuromuscular problems. Individuals who have had a stroke may have residual deficits that interfere with their handling of car controls and should also be referred.

- Recommend an comprehensive driving assessment (including an on-road assessment) performed by a DRS. A comprehensive on-road assessment is particularly useful for assessing the impact of physical fatigue, flexibility, and pain on the older adult's driving skills. The DRS may prescribe adaptive devices as needed (e.g., a spinner knob on the steering wheel to compensate for poor hand grip or an extended gear shift lever to compensate for reduced reach) and train the older adult in their use.

Next Course of Action

After administering CADReS assessment tools, three courses of action are possible (see also *Plan for Older Drivers' Safety*, Chapter 1):

- If the older adult performs well in all three areas from the CADReS toolbox, he or she can be advised that there are no medical contraindications to safe driving and offered counseling regarding health maintenance and future transportation plans. Older adults should be counseled on health maintenance by providing information such as *Ten Tips for Aging Well* and *Tips for Safe Driving* handouts, and the clinician should periodically follow-up on the older adult's driving safety. However, if there is evidence of a new onset of impaired driving behaviors (e.g., a decline from baseline) as described by the older adult and/or caregiver, further evaluation may be warranted despite a normal score.
- If the older adult performs poorly on any area of CADReS, but on clinical specialist evaluation the causes of poor performance are medically correctable, medical treatment and intervention should be pursued until the older adult's function has been optimized. The older adult may need to be counseled to limit driving as treatment proceeds. The level of improvement should be assessed with repeat administration of CADReS tools. Once the older adult performs well in all areas, he or she should be counseled on health maintenance (as above).
- If the poor performance on the CADReS toolkit cannot be medically corrected, or if no further potential for improvement with medical interventions is anticipated, the older adult should be referred to a DRS.

The CADReS toolbox is useful when supporting an in-office assessment, but it does not evaluate the older adult's performance in the actual driving task. Results, even if abnormal, are not sufficient to recommend driving cessation, except for vision and moderate/severe cognitive impairment. In this case, comprehensive driving evaluation with an on-road assessment performed by a DRS is needed. The DRS can more specifically determine the older adult's level of driving safety and potentially correct his or her functional impairments, if possible, through adaptive techniques or devices (see Chapter 5 and Appendix C).

State licensing policies are evolving, with each State establishing guidelines for issuing and revoking driver's licenses. Health care providers must be aware of the guidelines in their State and ideally other States in which the older adult drives, as available through chapter 8. The first responsibility, regardless of the State processes, is the identification of drivers who

exhibit a level of impairment potentially incompatible with continued driving. For those individuals, the message must be clear that driving must stop until further information is obtained. If the concern is medical (e.g., seizures, confusion), the individual must not drive until medical reports meet the State requirements for continued driving. If function on the road is in question, a comprehensive driving evaluation by a DRS provides the necessary evaluation data and intervention plan.

The recommendation for further evaluation is typically the result of a series of steps (as described in this chapter). Therefore, the driver should be informed both verbally and in writing that declining recommendations for further evaluation may put the patient and/or the public at risk for a crash or injury and could possibly start the State process for license revocation, including potential reporting to the State's Medical Review Board.

There will be cases when, in his or her best ethical judgment, the health care provider believes that the risk is very high and that the older adult will continue to drive despite the recommendation to stop driving. Clinicians must follow State laws for reporting to State licensing agencies and program/facility guidelines for informing the older driver and/or caregivers. Depending on the State's reporting laws, clinicians may be legally responsible for reporting "unsafe" drivers to the State licensing agency (for descriptions of legal and ethical responsibilities, see Chapters 7 and 8). In terms of best practice, the older adult should also be informed about this report.

The Copilot Phenomenon

Copiloting refers to a situation in which an individual drives with the assistance of a passenger who provides navigational directions and instructions on how to drive. Older adults with cognitive impairment may rely on passengers to tell them where to drive and how to respond to driving situations, whereas older adults with vision deficits may ask passengers to alert them to traffic signs and signals.

The use of copilots is not rare. In a study of the prevalence and cessation of driving among older men with dementia, about 10% of the 59 subjects who were still driving relied on copilots.²⁹ Older adults should be advised to not continue driving unless they are capable of driving safely without the use of a copilot. In many traffic situations, there is insufficient time for the copilot to detect a hazard and alert the driver, and for the driver to then respond quickly enough to avoid a crash. In such situations, the driver places not only himself or herself in danger but also the copilot and other passengers. Furthermore, the use of copilots to meet standards for licensure raises questions of who, exactly, is licensed to drive; how the presence of the copilot can be ensured; and what standards for medical fitness-to-drive should be applied to the copilot.³⁰

Older adults who are not safe to drive should be recommended to stop driving, regardless of their need or use of a copilot. Copilots should not be recommended to unsafe drivers as a means to continue driving. Instead, efforts should focus on helping older adults find alternative transportation for themselves and others who may depend on them. Conversely, some safe drivers feel more comfortable driving with a passenger who provides company and help with navigation. Although using a passenger to assist as a navigator is an acceptable practice, use of a copilot to provide instruction on how to drive is not recommended.

As long as older adult drivers have the ability to drive safely on their own, passenger assistance in navigation is an acceptable and advisable practice.

References

1. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. (2015, November). American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults. *Journal of the American Geriatrics Society*, 63(11), 2227-46.
2. National Highway Traffic Safety Administration. (2009, September). Driver fitness medical guidelines (Report No. DOT HS 811 210). Washington, DC: Author. Available at http://ntl.bts.gov/lib/31000/31100/31148/6061_MedicalReviewGuide_10-1_v2a.pdf
3. McGwin, G., Sarrels S. A., Griffin, R., Owsley, C., & Rue, L. W. 3rd. (2008). The impact of a vision screening law on older driver fatality rates. *Archives of Ophthalmology*, 126(11), 1544–1547.
4. Shipp, M. D. (1998). Potential human economic cost-savings attributable to vision testing policies for driver license renewal, 1989–1991. *Optometry & Vision Science*, 75, 103–118.
5. Johnson, C. A., & Keltner, J. L. (1983). Incidence of visual field loss in 20,000 eyes and its relationship to driving performance. *Archives of Ophthalmology*, 101, 371–375.
6. Bowers, A., Peli, E., Elgin, J., McGwin, G. Jr., & Owsley, C. (2005). On-road driving with moderate visual field loss. *Optometry & Vision Science*, 82, 657–667.
7. Szlyk, J. P., Mahler, C. L., Seiple, W., Edward, D. P., & Wilensky, J. T. (2005). Driving performance of glaucoma patients correlates with peripheral visual field loss. *Journal of Glaucoma*, 14, 145–150.
8. McGwin, G. Jr, Xie, A., Mays, A., Joiner, W., DeCarlo, D. K., Hall, T. A., & Owsley, C. (2005). Visual field defects and the risk of motor vehicle collisions among patients with glaucoma. *Investigative Ophthalmology & Visual Science*, 46(12), 4437–4441.

9. American Academy of Ophthalmology. (2006, March). Vision Requirements for Driving (Policy statement, revised and approved by Board of Trustees). Washington, DC: Author.
10. Wheatley, D. J., Carr, D. B., & Marottoli, R. A. (2014). Consensus statements on driving for persons with dementia. *Occupational Therapy in Health Care, 28*, 132-139.
11. Carr, D. B., Duchek, J. M., Meuser, T. M., & Morris, J. C. (2006). Older adult drivers with cognitive impairment. *American Family Physician, 73*, 1029–1034.
12. Iverson, D. J., Gronseth, G. . S., Reger, M. A., Classen, S., Dubinsky, R. . M., & Rizzo, M. (2010). Practice parameter update: Evaluation and management of driving risk in dementia (Report of the quality standards subcommittee of the American Academy of Neurology). *Neurology, 74*, 1316-1324.
13. Nasreddine, Z. (2010). Montreal Cognitive Assessment Administration and Scoring Instructions. Retrieved from the MOCA website at www.mocatest.org
14. Hollis, A., . M., Cuncanson, H., Kapust, L., . R., Xi, P. M., & O'Connor, M. G. (2015). Validity of the Mini–Mental State Examination and the Montreal Cognitive Assessment in the prediction of driving test outcome. *Journal of the American Geriatrics Society, 63*(5), 998–992.
15. Staplin, L., Gish, K. W., & Sifrit, K. J. Using cognitive status to predict crash risk: Blazing new trails? *Journal of Safety Research, 48*, 19–25.
16. Stutts, J. C., Stewart, J. R., & Martell, C. (1998). Cognitive test performance and crash risk in an older driver population. *Accident Analysis & Prevention, 30*(3), 337–346.
17. Tarawneh, M., S., McCoy, P. T., Bishu, R. R., & Ballard, J. L. (1993). Factors associated with driving performance of older drivers. *Transportation Research Record, 1405*, 64–71.
18. Ball, K. K., Roenker, D. L., Wadley, V. G., Edwards, J. D., Roth, D. L., McGwin, G. Jr., ... Dube, T. (2006). Can high-risk older drivers be identified through performance-based measures in a Department of Motor Vehicles setting? *Journal of the American Geriatrics Society, 54*, 77–84.
19. Royall, D. R., Cordes, J. A., Polk, M. J. (1998). Clox: An executive clock drawing task. *Journal of Neurology, Neurosurgery, and Psychiatry, 64*, 588–594.

20. Reger, M. A., Welsh R. K., Watson G. S., Cholerton, B., Baker, L. D., & Craft, S. (2004). The relationship between neuropsychological functioning and driving ability in dementia: a meta-analysis. *Neuropsychology*, 18, 85–93.
21. Royall, D. R., Mulroy, A. R., Chiodo, L. K., & Polk, M. J. (1999). Clock drawing is sensitive to executive control: a comparison of six methods. *Journals of Gerontology. Series B: Psychological Sciences and Social Sciences*, 54B(5), 328–333.
22. Freund, B., Gravenstein, S., Ferris, R., Burke, B. L., & Shaheen, E. (2005). Drawing clocks and driving cars. *Journal of General Internal Medicine*, 20, 240–244.
23. Snellgrove, C. (2005). Cognitive screening for the safe driving competence of older people with mild cognitive impairment or early dementia. Retrieved from the ATBS website at www.atsb.gov.au/publications/2005/pdf/cog_screen_old.pdf.
24. Langford, J. (2008). Usefulness of off-road screening tests to licensing authorities when assessing older driver fitness to drive. *Traffic Injury Prevention*, 9, 328–335. Eby D. W., & Molnar, L. J. (2010). Driving fitness and cognitive impairment: issues for physicians. *Journal of the American Medical Association*, 303(16), 1642–1643.
25. Stav W B., Justiss, M. D., & McCarthy D. P., (2008). Predictability of clinical assessments for driving performance. *Journal of Safety Research*, 39, 1–7.
26. Knopman, D. S. (2001). Practice parameter: diagnosis of dementia (an evidence-based review). Report of the Quality Standards Subcommittee of the American Academy of Neurology. *Neurology*, 56(9), 1143–1153.
27. Dugan, E., & Lee, C. M. (2013). Biopsychosocial risk factors of driving cessation findings from the health and retirement study. *Journal of Aging Health*, 25(8), 1313–1328.
28. Foley, D. J., Masaki, K., H., & Ross, G. . W., (2000). Driving cessation in older men with dementia. *Journal of the American Geriatrics Society*, 48(8), 928–930.
29. Fox, G. F., & Bashford, G. M. (1997). Dementia and driving: balancing personal independence and public safety. *Medical Journal of Australia*, 167, 406–407.

CHAPTER 5 THE DRIVER REHABILITATION SPECIALIST

Key Points

- A driver rehabilitation specialist (DRS) is a health care professional who is best qualified to make a fitness-to-drive decision when the at-risk older adult has functional impairments in physical, visual, or cognitive abilities.
- A comprehensive driving evaluation is completed by a DRS and includes clinical assessment of underlying component abilities, a medical and driving history, an on- road evaluation, and an alternative transportation plan if needed.
- Older adult driving programs vary in terms of typical providers, costs, availability, required knowledge, services provided, and according to the level of complexity of adaptive vehicles (i.e., basic, low tech, high tech), types of programs, and outcomes.
- Not all older adults require the specialized services of a driving rehabilitation specialist. Screening and assessment by appropriate clinical team members can collect necessary information for evidenced-based decisions.
- Before referring to a DRS, advise the older adult about the reason for the referral, the goals of the assessment and rehabilitation, the evaluation and tests that will be done, and the expected out-of-pocket cost for these services.

After scoring Mr. Phillips' (introduced in previous chapters) performance on the CADReS toolbox assessments, you discuss the results with him. You assure him that he scored well on the cognitive tests, but that his performance on the visual and motor tasks indicates a need for further evaluation and treatment. You recommend that Mr. Phillips make an appointment with his ophthalmologist, whom he has not seen for over a year. You also recommend that he begin exercising regularly by walking for 10-minute intervals, three times a day, and stretching gently afterward. His son, who is present at the clinic visit, offers to exercise with him several times a week.

When Mr. Phillips arrives for his follow-up appointment, he is wearing new glasses. His vision with the new glasses is 20/40 in both eyes. You retest his motor skills, and he is now able to complete the Rapid Pace Walk in 8.0 seconds. His range of motion on finger curl and neck rotation, however, remains restricted and his Trails B test has not improved. With Mr. Phillips' agreement, you refer him to a driver rehabilitation specialist (DRS) for an evaluation and adaptive equipment, if necessary.

Although there may be improvement in visual, cognitive, or physical abilities, older adults may still demonstrate functional impairments that affect their driving performance. In these cases, a driver rehabilitation specialist (DRS) is an excellent resource to explore solutions supporting continued driving. A DRS can perform a comprehensive driving evaluation that includes in-depth clinical assessment of functional abilities plus an on-road driving assessment. Based on

the older adult's performance, a DRS develops a summary of the evaluation results and an individualized plan for safe mobility. This plan may include any of the following:

- A recommendation for continued driving with or without restrictions (e.g., no night driving, no highways)
- An “interval recommendation” for reevaluation because of progressive conditions (e.g., early dementia, Parkinson disease). This may include a driving cessation plan (see Appendix C).
- Intervention to restore abilities (e.g., improve range of motion, strength, or flexibility)
- Adaptive techniques or the use of devices to compensate for functional deficits (e.g., hand controls, left foot accelerator)
- A recommendation for the older adult driver to cease driving

This last, difficult recommendation typically is followed by a plan to explore resources, alternative forms of transportation, and the supports the older adult requires (e.g., escort, curb- to-curb, or door-to-door). An example may be found in Appendix C. For those unwilling or unable to understand the cessation recommendation, caregivers should be provided with strategies to prevent access to the car and to manage ongoing resistance and arguments demanding access to the car. Other clinical team members may also be helpful when supporting older adults and caregivers who lack insight.

This chapter provides information about driver rehabilitation, the clinical specialty that offers comprehensive driving evaluation and planning, and what data is required to respond to the question, “Can_____drive?” For the clinical team, this question may follow an interaction with the older adult driver or a request from his or her caregiver. Physicians and nurse practitioners in particular may be asked to respond if the older driver receives a letter from a Medical Review Board, vehicle licensing agency, or law enforcement. An example may be found in Appendix C. Health care providers may be asked to complete a State medical reporting form such as the example found at <http://dor.mo.gov/forms/1528.pdf>.

The Driver Rehabilitation Specialist Defined

DRSs “provide clinical driving evaluations and driving mobility equipment evaluations and intervention to develop or restore driving skills and abilities.”¹

DRSs are often occupational therapists who have additional training in driver rehabilitation. In addition, DRSs with underlying degrees in medical fields may come from backgrounds such as physical therapy, kinesiotherapy, or psychology. Those with nonmedical backgrounds tend to come from transportation and community mobility backgrounds, such as driving school instructors.

Two national associations offer certification in driver rehabilitation. The Association for Driver Rehabilitation Specialists (formerly Association of Driver Educators for the Disabled, still known as ADED) requires education and experience qualifications and passing a certification examination (www.aded.net/?page=215). Persons of varied backgrounds may apply for

certification through ADED. ADED also requires that the certified driver rehabilitation specialists (CDRSs) renew their certification every 3 years by fulfilling a minimum amount of contact hours. The American Occupational Therapy Association (AOTA) offers Specialty Certification in Driving and Community Mobility (SCDCM) (www.aota.org/Education-Careers/Advance-Career/Board-Specialty-Certifications/Driving-Community-Mobility.aspx). This portfolio-based professional certification is awarded on approved application by a credentialing body at AOTA. The SCDCM includes a development plan and must be renewed, via application, every 5 years. Only occupational therapists may apply through AOTA for certification for this advanced level of achievement. Although many DRSs either hold certification or are in the process of obtaining the necessary education and experience to sit for the examination, in most States certification is not required to practice driver rehabilitation.

Functions of Driver Rehabilitation Specialists

DRSs evaluate the sensory (vision, proprioception), cognitive, and motor functional abilities which support driving skills, and may also provide assessment and/or training in the vehicle and on the road. DRSs can recommend either rehabilitation when restoration of abilities is deemed possible, or modifications (e.g., hand controls, left foot accelerator) to compensate for physical impairment. To address issues of normal aging and slowed processing, DRSs can recommend compensatory strategies that may include route modifications (e.g., no left turns, avoid rush hour) or suggest restrictions to support ongoing driving. Although driver rehabilitation programs vary, most typically consist of a comprehensive driving evaluation that includes the following elements:

Clinical Driving Evaluation

- Clinical assessment, including review of driving history, driving needs, and license status; review of medical history and medications; functional assessments of vision/perception; physical abilities (may include range of motion, motor strength, coordination, sensation, and/or reaction time); and cognition.
- On-road evaluation to determine degree of safety risk for driving, including assessment of vehicle ingress/egress, mobility aid management (e.g., ability to transport a wheelchair or scooter), vehicle preparation, vehicle control, adherence to traffic rules and regulations, environmental awareness and interpretation, and consistent use of compensatory strategies for visual, cognitive, physical, and behavioral impairments.
- Communication of assessment results and recommendations to the older adult, the caregivers, and/or referring health care provider/agency. Although this is the most frequent model, the process for communication of results may vary by program model and local referral agreement. Variations include sending driving evaluation results to the clinical team to relay to the older adult driver and caregivers:

- Return to driving with adaptive driving equipment and instruction after installation and/or driver retraining using a vehicle equipped to match the older adult's individual needs.
- Recommendations consistent with State laws for continued driving with restrictions. Some States do not offer restrictions, whereas others may limit geographic areas (e.g., 5-mile radius from residence or local routes) or conditions (e.g., no night or highway driving) in which the older adult drives. (*Note:* Recommendations are informal, but "Restrictions" describe a licensing action associated with the license similarly to how listing a required vision correction is part of licensure.)
- Return to driving after education or refresher, including self-study, classroom, or on-road. It is important to specify if the intention of seeking on-road driving lessons is to establish/maintain defensive driving skills.
- Interval" reevaluation is indicated when an older adult demonstrates adequate skills to drive at present but has a progressive disorder that may cause future decline (e.g., dementia, Parkinson disease).
- Temporary driving cessation, noting potential for improvement and driving in future. Recommend intervention to improve deficits in vision, perception, motor and/or cognition. This is advised when the older adult has medical condition(s) that can improve over time (e.g., stroke, heart attack, traumatic brain injury) and can return for reevaluation.
- Permanent driving cessation. This is advised when an older adult does not demonstrate the necessary skills to compensate for visual, perceptual, or cognitive deficits to safely resume driving, and the potential for improvement, even with intervention, is poor. In these cases, the message is that all options were explored and considered. Alternative transportation options and a support network should be addressed with the older adult.

Passenger Vehicle Evaluation

- Assessment of vehicle, vehicle modifications, and equipment needed for the older adult's safe transport as a passenger or driver.
- Needs of caregivers as drivers or passengers should also be considered (e.g., inability to assist with transfer due to arthritis, limitations in stowing mobility devices, transporting scooter). In these cases, certain lifts or tie-down systems may be recommended because of a caregiver's physical limitations.

Treatment and Intervention

- Adaptive driving instruction or driver retraining, with or without vehicle modifications.
- Coordination of vehicle modifications:

- Vehicle consultation: The DRS serves as a consultant to older adults who are purchasing a new vehicle to ensure that the vehicle will accommodate the necessary mobility limitations (door opening or seat height to optimize ease in transfer, ease in applying adaptive equipment now or in the future).
- Vehicle modification recommendations: The DRS provides written recommendations for all vehicle/equipment needs to the older adult driver, third-party payer, and vehicle/equipment dealer.
- Adaptive Equipment/Vehicle modification inspection: The DRS is involved with the older adult and adaptive equipment dealer in a final fitting to ensure optimal functioning of the recommended vehicle/equipment.

A comprehensive driving evaluation can last 1–4 hours, depending on the older adult's disabilities and driving needs. After the clinical driving evaluation, the on-road evaluation is performed if the older adult driver meets the minimum State standards for health and vision and holds a valid driver's license or permit. The on-road evaluation is performed in the DRS's vehicle equipped with dual brakes, a rear-view mirror and eye-check mirror for the DRS, and any necessary adaptive equipment. (Note: Some programs divide the evaluation into 2 days in consideration of fatigue or require on-road driving on two separate occasions to evaluate for consistency).

Older adults who perform poorly on the clinical driving evaluation may or may not be offered the on-road portion of the evaluation. If the older adult driver is deemed too impaired, the risk to the driver and evaluator may preclude an on-the-road evaluation for safety reasons. However, even after poor performance on the clinical driving evaluation, the DRS may still conduct an on-road evaluation in some cases:

- Older adults who perform poorly on some individual components of the clinical driving evaluation may still demonstrate safe driving because there is no assessment tool that accurately predicts on-road performance as clearly as the on-road assessment and driving is an overlearned skill.^{2,3,4}
- Older adults and their family and caregivers may need concrete evidence of unsafe driving. However, in the case of the older adult with cognitive impairment that lacks insight, the on-road evaluation may in fact not change their perception.

Older Adult Drivers Who Can Benefit from Driver Rehabilitation Specialists

Driver evaluation and rehabilitation are appropriate for older adult drivers with a broad spectrum of visual, physical, and/or cognitive disabilities. DRSs work with older adult drivers who have dementia, stroke, arthritis, low vision, learning disabilities, limb amputations, neuromuscular disorders, spinal cord injuries, mental health problems, cardiovascular diseases, and other causes of functional deficits.

Vehicle modification can be as straightforward as providing extended gear shift levers, padded steering wheels, or extra/larger mirrors to patients with arthritis, and training the older adult driver in their use.

Rehabilitation can also be as complex as working with an older adult with dementia and his or her caregivers to determine the individual's driving needs, plan appropriate driving routes (e.g., avoiding left hand turns or busy intersections), supervise practice drives, and provide close and extended follow-up.

Services of Driver Rehabilitation Specialists

Because driver rehabilitation is a multidisciplinary profession, programs are diverse and provide services at different levels; clinical team members should recognize which level is needed when referring an older adult driver to a DRS.

The three main levels of DRS programs can be defined as basic, low tech, and high tech (Table 1, Appendix C). The basic program is appropriate for older adult drivers with limited physical impairments who require only very basic adaptive equipment in the vehicle. The low-tech program can address the needs of older adult drivers who may need mechanical or low-tech vehicle modifications or equipment (e.g., hand controls, left foot accelerator, spinning knob for one-handed steering), including training in safe use on the road. The high-tech program is necessary for older adults who need to drive from a wheelchair or need high-tech equipment, such as low-effort steering.¹ Upper level programs also provide basic program services.

Other services can also provide support for some older adults without specific medical conditions who may need help with driving. For example, if an older adult has a stroke and can no longer drive, and the spouse has a license, but has not driven in 10 years, referring the spouse to a driving school for a driver refresher course may improve confidence and safety.

Ideal programs will offer road time with a driving instructor. Conversely, if an older adult demonstrates clear impairments in other instrumental activities of daily living (IADLs) but is focused on the IADL of driving, the clinical team could consider referral to a general practice occupational therapist who can offer a traditional professional evaluation of IADLs, including high level/complex IADLs. The question of driving competence may be the first clue the clinical team has that may lead to a general review of IADL status and intervention goals to improve quality of life. Through this pathway, the clinical team and/or the occupational therapist can determine when or if the older adult may be prepared to benefit from comprehensive driving evaluation.

Performing a driving evaluation too early in an older driver's recovery may result in failure that could be misunderstood as permanent, such as in patients with stroke who have not fully recovered. If the older adult agrees to not drive until evaluated, delaying until after a recovery period of 6 to 12 months, the outcome may be more favorable, preventing premature driving cessation.

It is important to note that the services of an occupational therapist are covered by third-party payers, Medicare, and Medicaid.

Cost of Driver Assessment and Rehabilitation

The cost of driver assessment and rehabilitation varies between programs and according to the extent of services provided. As a general figure, the range of the private-pay model is currently about \$300 to \$600 for a full assessment and \$125 an hour for rehabilitation. If adaptive equipment is required, sample costs might be approximately \$70 to \$100 for a spinner knob, \$400 to \$500 for a left foot accelerator, and \$700 to \$900 for hand controls. Costs for reduced-effort steering systems, wheelchair lifts, raised roofs, and dropped floors on vans run in the thousands of dollars.

Two programs that have funding to cover expenses associated with comprehensive driving evaluations, driver rehabilitation, and vehicle modifications are States workers' compensation and vocational rehabilitation programs. These programs focus on the disability population and return-to-work, so many older adult drivers will not qualify for either program. Coverage from Medicare, Medicaid, and private insurance companies is variable and depends on local interpretation of policies (e.g., government fiscal intermediaries). The Veterans Administration programs may also cover DRS evaluations and training for spinal cord and mobility-related injuries, although not all States have a VA driver rehabilitation program. Many driver rehabilitation programs choose to offer private pay only, because current reimbursement models are inadequate to cover the expenses of this individualized and highly trained service. Because rates and extent of insurance reimbursement vary, older adult drivers should be encouraged to inquire about program rates, insurance coverage, and payment procedures when they are required to pay up-front and receive reimbursement at a later time.

Of interest, a recent source of funding for DRS services has been for one automobile insurance company to add reimbursement for a comprehensive driving evaluation to its auto insurance plan in some regions, if performed by a DRS who is also an occupational therapist, for up to 3 years after an accident and up to \$500. When balanced against the personal and global costs to the older adult driver and the community of a crash, or services needed to support an older adult lacking independent mobility, this may prove to be a cost-savings strategy.

Finding a Driver Rehabilitation Specialist

Driver rehabilitation programs and DRSs are located across the country, although availability is typically in urban areas or large medical centers. DRSs can be in private practice or affiliated

with hospitals, rehabilitation centers, driving schools, and State departments of motor vehicles. DRS services may also be accessed through area agencies on aging, universities, and area departments of education. Before referring older adults to driving rehabilitation services, it is important to ensure the appropriate level of service needed is available. The credentials and knowledge level of the provider, typical services provided, and expected outcome should match the needs of the older adult driver and caregivers. A background in driver education alone is likely insufficient for appropriate assessment of medically impaired drivers and correct interpretation of the assessment.

To find a DRS in the local area, calling the occupational therapy departments in local hospitals or rehabilitation centers is a good place to start. The local chapters of subspecialty organizations such as the Alzheimer Association may keep up to date driving evaluation program information on their websites. The ADED's online directory is a good source of information (<http://aded.site-ym.com/search/custom.asp?id=1984>) and lists DRS services by State and type of program. The AOTA website is another source to locate a DRS by State (http://myaota.aota.org/driver_search/index.aspx). Many local chapters of the Alzheimer's Association (www.alz.org/care/alzheimers-dementia-and-driving.asp) also provide lists of area driving evaluation programs.

When selecting a DRS or driver rehabilitation program, the older adult driver and/or caregivers may wish to inquire:

- How many years of experience does the DRS (or program) and what types of clients do they serve? In many cases, experience may be a more important indicator of quality than certification alone. There are many well-qualified DRSs who are not certified.
- Does the DRS provide a comprehensive driving evaluation that includes both clinical and on-road assessments? A DRS who provides both components of the evaluation (or a program whose team of specialists perform both components) is ideal. Referral to two separate specialists or centers is inconvenient for the older adult and the clinical team member and often presents a greater insurance reimbursement challenge. In addition, some programs use a driving simulator program, which should not be used to replace the on-road component. Simulators have the advantages of reliability and safety, but they are not standardized and have limited validity when compared to the performance based road test. In addition, in older adults they may induce motion sickness, which can limit the findings.
- Does the DRS provide rehabilitation and training? A comprehensive DRS provider and/or program should ideally be experienced in both evaluation and rehabilitation. If the older adult driver will likely need any adaptive devices or vehicle modifications, he or she and their caregivers should go to a "low tech" or "high tech" program (see Appendix C) that has the appropriate equipment to evaluate and train the driver in their use.
- How much can the older adult driver expect to pay out-of-pocket for assessment, rehabilitation, and adaptive equipment?
- Who will receive a report of the assessment outcome? Most of the time, reports are

sent to the older adult driver and to the referring clinical team member and/or referring agency (e.g., workers' compensation or office of retirement services) Some DRSs also send reports to caregivers, at the request of the caregiver and with the older adult's consent. Whether or not the DRS reports to the State licensing agency is variable and should be clearly stated before the evaluation is initiated. In States with mandatory reporting laws, the DRS and/or physician may send a report to the State licensing agency; even if reporting is not legally required, some DRSs will still send a report in the interest of public safety and ethical responsibility.

- If the older adult receives recommendations to cease driving, does the DRS provide any counseling or aid in identifying alternative forms of transportation? Note that DRS counseling does not preclude the need for follow-up by the clinical team. Many times, the older adult and caregivers may be too distressed at the time of DRS counseling to deal with additional information. Mobility counseling is crucial for reinforcing this information and providing continued mobility in the community, as well as demonstrating the health care provider's involvement and support.

Making the Referral

Before making the referral, advise the older adult about the reason for the referral, the goals of the assessment and rehabilitation, the evaluation and tests that will be done, and the expected out-of-pocket cost for these services.

“Mr. Phillips, I’m pleased that you can see better with your new glasses and that your physical fitness has improved with your walking. I’d like you to keep up the good work. However, I’m still concerned about slowed processing and ability to move your neck. I’m worried that you can’t see around you well enough to drive safely. I’d like to send you to someone who can assist us with your driving abilities. Consider this a kind of “driving check-up” to be sure you are fit to drive.

“A person called a driver rehabilitation specialist will ask you some questions about your medical history and test your vision, strength, range of motion, and thinking skills—similar to what we did the last time you were here. He or she will also take you out on the road and watch your driving. He or she might recommend some accessories or modifications for your car, such as extra mirrors, and show you how to use them.

“The cost of these assessments ranges anywhere from \$300 to \$400, and there may be additional costs for accessories or rehabilitation training. However, it is possible that insurance may pay for part of the assessment and training. I know this sounds like a lot of money, but I think this is important for your safety. If you were in a serious car crash, your medical bills or the costs for someone you injured could end up costing you more money. We should try to prevent that from happening.”

Some programs require a written physician prescription, others may not. Understanding your local requirements or clinic policies are important to appropriately and efficiently referring the older adult. A driving evaluation prescription should list specific reasons and needs that justify the evaluation and/or rehabilitation. For example, “OT driver evaluation for hand weakness such as poor finger flexion or for limited neck rotation secondary to arthritis,” “DRS evaluation for hemianopsia secondary to stroke,” or “DRS evaluation for cognitive impairments secondary to Alzheimer disease” provide guidance for the DRS and are more likely to be reimbursed by insurance. (Most DRS programs will also send the physician a referral form that includes space for a list of current diagnoses and medications.) In contrast, vague orders for “an older adult,” “debilitated,” or “frail” older adult do not provide adequate guidance to the DRS and can complicate insurance reimbursement.

If appropriate and feasible in the clinical team setting, a follow-up appointment should be scheduled for after the driving evaluation. If the older adult is safe to drive (with or without restrictions, adaptive devices, and/or rehabilitation), recommendations made by the DRS should be reinforced. When applicable, caregivers should be informed of these recommendations. Also remember that older adult drivers should be counseled on health maintenance and safe driving behaviors, and encouraged to start planning alternative forms of transportation in case they ever become necessary. If the older adult is not considered fit to drive, then mobility access should be ensured and followed up with services that support driving cessation (see Chapter 6).

Special mention is made of other rehabilitation specialists who may help address impairments that are not uncommon in older adults. For instance, physical therapists may be able to improve muscle weakness, range of motion, or physical frailty. Visual rehabilitation may be available in some specialized centers. Neuroophthalmologists or optometrists may provide vision training, especially for older adults with neurologic insults that affect convergence, alignment, nystagmus, eye apraxia, and/or visual neglect from stroke, head injury, brain tumors, and trauma.

When Driver Assessment Is Not Option

Unfortunately, driver evaluation and rehabilitation services may not always be readily available in the local area. Even if a DRS is available, the older adult may refuse further assessment or be unable to afford it. However, some patients and caregivers in DRS shortage areas may be willing to travel to have this type of evaluation, particularly if the chances are good that the evaluation may result in prolonging driving life expectancy and safety.

It is important to distinguish whether this is an elective recommendation or essential to ongoing driving. If the latter, steps for stopping driving until assessment is done must be clearly communicated to the older adult driver and caregivers and, if necessary, also to the State licensing authority. Older adults who refuse on the basis of cost should be reminded that operating a motor vehicle is expensive and that this type of assessment is critical for safety and important when considered against the cost of a motor vehicle crash. It is the clinician's ethical duty to report to the licensing authorities, if there are clear indications that the older adult is demonstrating unsafe driving practices with resulting risk to themselves and the public.

If comprehensive driving evaluation through a DRS is not available, there are several options:

- Advocacy efforts can be undertaken to inform local rehabilitation providers that the clinical team is seeking local driving rehabilitation services for older adults. Rehabilitation providers must know of local interest to recognize the need for program growth.
- Most occupational therapists are “generalists” who can provide an occupational therapy evaluation of IADLs. (These are typically provided services reimbursed by Medicare and Medicaid as occupational therapy services). Because driving is an IADL, these assessments can be used to determine driving risk and potential for risk. Occupational therapists in general practice may also be able to perform specific assessments that provide results correlated to driving risk as well as mobility counseling. Referral to these types of health professionals may actually be a more widely available option in many communities.
- Driving education specialists are often based at high schools or affiliated with programs for novice drivers. Some of these specialists have developed experience in assessing and counseling older adult drivers. Certain instructors may also be affiliated with a medical facility and provide the on-road component of the comprehensive driving evaluation.

- Private driving schools and driving education programs may be available in the local area. However, they may not have expertise in evaluating older adults with medical impairments.
- Further evaluation by another health professional such as a geriatrician, neurologist, psychiatrist, or neuropsychologist can be considered for an older adult who has a chronic condition such as Alzheimer disease or an episodic acute illness (e.g. seizure disorder).
- If changes in driving behavior are likely to improve the older adult's driving safety (e.g., avoiding driving at night, rush hour, adverse weather conditions, etc.), the clinical team member can make recommendations. However, officially, State policies vary in the area of restrictions. Strict adherence to these policies can be made a condition for licensing through the State licensing agency or Medical Review Board. State policies should be checked before making these recommendations. It also has to be acknowledged that the research literature on the benefits of license restriction is not clear. In general, when possible, it is generally better to lean towards driving autonomy with license restriction, but if there are concerns that the older adult would not honor the restrictions then driving cessation may be the best option.
- If the older adult's driving safety is an urgent concern, the clinician may wish to report to the State licensing agency, which will have steps to follow that may include a State driving assessment. Depending on the particular State's reporting laws, physicians may be legally responsible for reporting "unsafe" drivers to the State licensing agency. (For a discussion of the legal and ethical issues, see Chapter 7; for a list of State licensing agencies and other resources on State laws, see Chapter 8.) The older adult should be made aware of the referral/report to the State licensing agency, which should be documented and also offered to the older adult in writing. This may place the clinical team member in a difficult position. Many States require physicians to fill out forms that require medical information and vision testing results and to provide an opinion on whether the driver should undergo visual and/or on-road testing.
- If the older adult has no medical contraindications to continued driving, he or she should be offered education and handouts such as the *Ten Tips for Aging Well and Safe Driving Tips* (available in this guide). All older adults should be encouraged to develop a driving plan, and to become familiar with and able to successfully access alternative forms of transportation. Planning ahead is invaluable to support aging in place while bridging short- or long-term disruptions in the most common and familiar form of transportation—the personal vehicle.

References

1. Transportation Research Board (in press). A Taxonomy and Terms for Stakeholders in Senior Mobility. Washington, DC: Author.
2. Dickerson, A. E. (2013). Driving assessment tools used by driver rehabilitation specialists: Survey of use and implications for practice. *American Journal of Occupational Therapy*, 67, 564–573.
3. Classen, S., Dickerson, A. E., & Justiss, M. (2012). Occupational Therapy Driving Evaluation: Using Evidence-Based Screening and Assessment Tools. In J. Maguire & E. S. Davis (eds.). *Driving and Community Mobility: Occupational Therapy Strategies Across the Lifespan*. Bethesda, MD: AOTA Publishing.
4. Eby, D. W., Molnar, L. J., & Kartje, P. S. (2009). Maintaining safe mobility in an aging society. London: CRC Press.

CHAPTER 6 ADVISING THE OLDER ADULT ABOUT TRANSITIONING FROM DRIVING

Key Points

- Health care providers should proactively/annually screen frail older adults for driving safety and consider referral for comprehensive driving evaluation by a driving rehabilitation specialist/occupational therapist.
- Health professionals should encourage discussion of a driving retirement plan *prior* to the patient losing their privilege to drive.
- When an older adult is unsafe to drive, they and their caregivers should review the assessment and conclusions and discuss alternative transportation options; this should be documented in the older adult's health record.
- If an older adult who is unsafe to drive continues driving, caregiver responsibility and intervention (when available) is important to document. A "do not drive" prescription that is provided to the older driver and if appropriate, the caregiver, should be considered if the patient is medically unfit to drive. The clinician should also consider, sending a formal letter to the older adult recommending driving cessation and notifying the State licensing agency.
- Clinicians should know referral sources in the community that can provide mobility counseling and information on local transportation alternatives such as gerontological care managers, social workers CDRS's, and local Agencies on Aging.

Mr. Phillips returns for a follow-up visit after undergoing driver assessment. The driver rehabilitation specialist (DRS) recommended that wide-angle rearview mirrors be fitted on Mr. Phillips' car. Mr. Phillips states that he is driving more comfortably with this adaptive device. You counsel him on the Tips for Safe Driving and Ten Tips for Aging Well, advise him to continue walking, and encourage him to start planning alternative transportation options. His daughter is recruited to assist Mr. Phillips and his son with these discussions and interventions.

You continue to provide care for Mr. Phillips' chronic conditions and follow up on his driving safety. Three years later, Mr. Phillips has a right middle cerebral artery stroke and deficits of left-sided weakness and hemispatial inattention. His health has declined to the extent that you believe it is no longer safe for him to drive. You also feel that because of the fixed nature of his deficits (longer than 6 months since the event), driver rehabilitation is unlikely to improve his driving safety. Mr. Phillips has decreased his driving over the years, and you now tell him that it is time to stop driving completely. Mr. Phillips replies, "We've talked about this before, and I figured it was coming sooner or later." He believes that rides from family and friends and the senior citizen shuttle in his community will be adequate for his transportation needs, and he plans to give his car to his granddaughter.

For most of us, driving is a symbol of independence and a source of self-esteem. When we retire from driving, we lose not only a form of transportation but also all the emotional and social benefits derived from driving. In primary preventive care, the transition to cessation of driving may be discussed during the Medicare Annual Wellness Visit. The Medicare Learning Network (detailed on www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/downloads/AWV_chart_ICN905706.pdf) provides educational products and information to proactively address health conditions that may adversely affect driving ability.

Advance planning for driving cessation ideally will be reviewed along with other standard instrumental activities of daily living in primary prevention. In secondary prevention, referral to the clinical team can assist with anticipation of and preparation for driving cessation¹, rather than responding abruptly in an acute need.

For various reasons, clinical team members may be reluctant to discuss driving cessation with older adults. Clinicians may fear delivering bad news or be concerned that the older adult will lose mobility and all its benefits. Clinicians may also avoid discussions of driving altogether, because they believe that an individual will not heed their advice or become angry. Clinicians may be concerned about losing an individual to another practice.

These concerns are all valid. However, clinical team members have an ethical responsibility to protect the safety of the older adult, as well as that of the public, through assessing driving-related functions, exploring medical and rehabilitation options to improve driving safety, and when all other options have been exhausted, providing recommendations for restriction or cessation of driving. Within the clinical team, the physician is often considered key for driver licensing and assessment referral. The development of a universal State licensing agency fitness-to-drive form would assist with clear, objective medical documentation,² along with consistent guidelines across States.

In tertiary preventive care, when it is clear to the clinical team that an older adult driver must stop driving, the team must manage such challenging cases, including encouraging the older adult driver to involve caregivers in creating a transportation plan and obtaining the older adult driver's permission when involving his or her support system.

Useful Steps in Counseling Older Adults to Stop Driving

Begin with the older adult's perspective

An initial assessment of the older adult's perception of his or her driving ability often directly impacts the process in which a person redefines not only personal mobility but also public risk. Reviewing the self-perceived driving skills of the older adult is critical in any discussion regarding driving cessation. Interviews of older adult drivers demonstrate the critical attitudes combined with social pressure impacting driving conduct.³ The older adult's individual epiphany, self-determination, confidence, autonomy, and relatedness to social

activity require understanding by the clinical team.

When drivers 65 and older were studied regarding when they would terminate driving, responses were extremely varied. Responses included the following: cessation at a definite age (half stated during their 90s), at the onset of vision decline, at no time would they terminate driving (1 in 10), or cessation when they believed they became a hazard on the road.⁴

Assess family/caregiver readiness for mobility transition.

Whenever available, there is no substitute for caregiver support in developing plans for driving cessation. It is important early on to determine whether or not the older adult has any caregivers who can support their transition. Caregivers often wish the clinical team would intervene and recommend driving cessation for the older adult.⁵ For a planned transition from driving by the clinical team to be successful, the caregivers' buy-in to a unified position and support is critical. It is very difficult to successfully counsel older adults to stop driving if their caregivers wish them to continue operating a motor vehicle or disagree among themselves.

Remember that if there is an involved caregiver, they are the one constant and consistent member of the "team." Education of the caregivers may increase informed decision-making and prevent plan-of-care errors.⁶ When no caregiver support is available, it is very important to engage local resources through community agencies such as Area Agencies on Aging to provide additional services.

Utilize a clinical team.

Clinical teams require skill sets, assessment instruments, and an appreciation of age-related driving retirement challenges. Because driving cessation involves so many aspects of the older adult's coping style and physical and mental health, the availability of social support and a clinical team sensitive to age-related mobility change is critical to address multiple needs and direct an intervention plan.⁷

Develop clinical team communication.

Clinical teams concur that concise communication is both fundamental and one of the most challenging aspects of good care during a transition process. Cultural heritage must be acknowledged and respected in decision making, because a lack of understanding may prevent the older adult from requesting clarification. Older adults with compromised health literacy may agree with the clinician in an effort to maintain their dignity, even when they do not fully understand medical terminology.⁸

Explain the Importance of Driving Cessation

If the older adult driver has undergone the CADReS toolbox assessments (see Chapters 3 and 4) or assessment by a driver rehabilitation specialist, results in simple language should be provided to the older adult driver and his or her caregivers to share and discuss. Results

should be clearly explained, including what they indicate about the older adult driver's level of function and why this function is important for driving. The potential risks of driving should be stated, ending with the recommendation that the older adult stop driving. This might be a good time to discuss the older adult driver's thoughts or feelings, especially if he or she were to cause a vehicle crash. If the older adult should not drive, you might discuss issues related to injury, public safety, and/or financial liability. This discussion should be put in writing with copies given to the older adult driver. If the older driver lacks decision-making capacity, a copy should be given to a family member or caregiver.

“Mr. Phillips, the results of your eye exam show that your vision isn’t as good as it used to be. Good vision is important for driving because you need to be able to see the road, other cars, pedestrians, and traffic signs. With your reduced vision and now that you’ve had a stroke, I’m concerned you’ll be in a car crash. Because your visual deficits from your stroke cannot be corrected to a level safe for driving, for your own safety and the safety of others, it’s time for you to retire from driving. In addition, there are legal requirements for vision that, unfortunately, you no longer meet.”

Older adult drivers may become upset or angry at the clinical team's recommendation to curtail driving. These feelings should be acknowledged, and although clinicians should be sensitive to the practical and emotional implications of driving cessation, it is necessary to remain firm with the recommendation. Engaging in disputes or long explanations should be avoided. Instead, the focus should be on making certain the older adult understands the recommendation and that it was made for his or her safety. If the older adult driver is mentally competent and willing to allow a caregiver to be present at the visit, this may be helpful when communicating this sensitive information. All discussions should be documented in the health record. It is critical for the clinical team to reinforce, reinterpret, and follow up with the older adult driver and caregiver during this transition.

Discuss Transportation Options

Once a driving cessation has been recommended, possible transportation alternatives need to be explored and discussed with the older adult. Unfortunately, driving cessation has been associated with a decrease in social engagement, depression, anxiety, and long-term care placement.⁹ Older adults should be encouraged to take control of their future by creating a transportation plan. (If the individual does not have the cognitive capability for these tasks, see the section on those who lack decision-making capacity later in this chapter.)

Providing the older adult resources to explore options (e.g., handouts in Appendix B) will help empower him or her to formulate a personal plan for transportation. Special mention is made of The Hartford's (The Hartford Center for Mature Market Excellence) educational

guidebooks: *We Need to Talk: Family Conversations with Older Drivers* (available at www.thehartford.com/mature-market-excellence/family-conversations-with-older-drivers), *At the Crossroads: Family Conversations about Alzheimer's Disease, Dementia & Driving* (available at www.thehartford.com/sites/thehartford/files/crossroads-kit-intro.pdf), and *You and Your Car: A Guide to Driving Wellness* (available at http://hartfordauto.thehartford.com/UI/Downloads/You_and_Your_Car.pdf).¹⁰ Using alternative transportation options, such as buses, trains, cabs, or even walking, offers older adults independence from having to rely on others. However, these may not be reasonable alternatives for those with physical frailty and/or dementia. It may be useful to use the Beverly Foundation's dementia friendliness calculator (based on the 5 A's of transportation: availability, acceptability, accessibility, adaptability and affordability) when searching for services¹¹.

A discussion of driving alternatives can begin by asking if the older adult has made plans to stop driving or how he or she currently finds rides when driving is not an option. Alternative transportation methods (Table 6.1) should be explored, as well as any barriers the older adult foresees (e.g., financial constraints, limited service and destinations, required physical skills for accessibility).

The older adult may need assistance to identify his or her most feasible transportation options, because certain cognitive and physical skills are often necessary to use particular transportation alternatives. The importance of planning ahead for social activities, which contribute to quality of life, should be stressed. Older adults in driving retirement should be encouraged to contact the Area Agency on Aging and/or Alzheimer's Association for information on local resources such as taxis, public transportation services, and senior-specific transportation services. For connection to senior services nationwide, The Eldercare Locator (800-677-1116 or at www.eldercare.gov/; be prepared to provide the relevant city and State) can provide connections to senior services nationwide. This might be a good time to refer to clinical teams, including a social worker, nurse, or a gerontologic care manager. The team may be aware of alternative modes of transportation and/or may deal with the older adult's feelings of social isolation or depression.

Older adults should be encouraged to involve caregivers and supportive friends and to form a team in creating a transportation plan. The older adult's permission should always be obtained when involving others, who should be encouraged to offer rides and formulate a weekly schedule for running errands. However, the older adult should not be ignored when caregivers are included in the discussion. Help in arranging for delivery of prescriptions, newspapers, groceries, and other services may also be considered (see Table 6.2).

Reinforce Driving Cessation

When the message to cease driving is essential for ensuring the older adult's safety, this also places a significant demand on the adult to change his or her current behavior. Therefore, the

clinical team will need to ensure the older adult understands the reasons (legal, health, and safety) for the driving cessation recommendation. In many cases, older adults may become argumentative or emotional during the office visit. They may not fully comprehend the recommendations or remember all the information provided. Messages can be reinforced by the following:

- Make open-ended statements, such as “Please share with me your concerns regarding the assessment and recommendations.” Reassure the older adult that you and the clinical team are available if he or she has questions or needs further assistance.
- Use a teach-back technique by requesting the older adult to repeat why he or she must not drive. Stress that this recommendation is for his or her personal safety and the safety of others on the road.
- The older adult driver may benefit from visual reinforcement of a prescription with the words “Do Not Drive.” Ensuring that the older adult understands why he or she is receiving this prescription may help avoid feelings of anxiety or anger. See Table 6.3 for further reinforcement tips.
- Send the older adult a letter that recommends driving cessation (see Table 6.6 for a template). Place a copy of this letter in the health record as both documentation and another visual tool for reinforcement. The letter should be written in simple language to ensure the older adult understands the clinical team’s recommendation.
- The clinical team must understand each State’s reporting requirements and explain this requirement to the older adult driver and caregivers (see Chapters 7 and 8 for more details). State regulations, in the case of mandatory reporting laws, dictate that older adult drivers and possibly by proxy, their caregivers,) must inform the local State licensing agency of medical conditions that could affect the older adult’s safe operation of a vehicle. The older adult should be informed that the State licensing agency will follow up and what to expect as part of this evaluation (i.e., a review of the driving record, a medical statement, potentially on-road testing).
- In States with voluntary laws, a referral to the licensing agency could still be appropriate, and older adults may be informed that they will be reported, if they drive against medical advice.
- Help facilitate caregiver assistance in encouraging driving cessation, and if necessary, encourage the older adult to self-report his or her impairment to the State licensing agency. It may be helpful to enlist other trusted allies, such as clergy, friends, or the family attorney.
- Request the older adult driver return in 1 month for a follow-up assessment (see next section).

Follow-Up with the Older Adult

At the older adult's follow-up appointment, clinicians should assess:

- The older adult's ability to comply with the driving cessation recommendation
- Transportation resources the older adult identified and has or has not used, evaluating the viability of the chosen options
- Signs of isolation or depression

The assessment should begin by asking the older adult how he or she got to the appointment that day. This will help determine whether the older adult has been able to plan for and schedule transportation to and from necessary appointments. Ensure that the older adult has secured reliable and sufficient transportation resources to meet his or her needs.

Utilize the clinical team; refer to a social worker or gerontologic care manager.

Clinician: *I'm pleased to see you for your follow-up appointment today. How were you able to get to the office?*

Mr. Phillips: *Oh, my son dropped me off.*

Clinician: *I see. Has he been driving you lately?*

Mr. Phillips: *Yes, ever since I stopped driving, he and his wife have been taking me where I need to go. He's going to pick me up in 15 minutes.*

Clinician: *How has that been working for you?*

Mr. Phillips: *It's worked quite well.*

Clinician: *I have a prescription for you to refill your medicines after our appointment. Will your son be able to take you to the pharmacy?*

Mr. Phillips: *Yes, that won't be a problem.*

Clinician: *It's wonderful that your son and daughter-in-law are a reliable source of rides for you. What do you do when they are unable to drive you where you need to go?*

Mr. Phillips: *I am stuck at home.*

Frailty symptoms (weakness, slow gait speed) combined with depression yield the consequence of higher mortality in older adults.¹² In all levels of care, clinicians should be alert to signs of depression, neglect, and social isolation (see Tables 6.4 and 6.5). It is important to continue to monitor older adults for any signs of worsening mental or physical health and to ask how they are managing without driving. Caregivers should be educated on signs of depression and asked if they have any concerns. Clinicians should consider using formal

assessments for depression such as the Geriatric Depression Scale or the PHQ-9.

The older adult's functional or cognitive impairments should continue to be assessed and treated. If the older adult improves to the extent that he or she is safe to drive again, the individual should be notified and given the resource sheet on *Tips for Safe Driving* (see Appendix B).

Situations That Require Additional Counseling

Additional counseling may be needed to encourage driving retirement or to help older adults cope with this loss. Potential situations that may arise with individuals who have difficulty coping or adhering to the recommendation to stop driving are described below.

The Resistant Older Adult Driver

If the older adult becomes belligerent or refuses to stop driving, it is important to understand why. Knowing the reason will help to address the individual's concerns.

Be sure to listen and use supportive statements when addressing the older adult's concerns. Let the individual know you are an advocate for his or her health and safety.

Remember that driving cessation can have severe emotional and practical implications, and older adults may have a difficult time adjusting.

Asking the older adult driver to define when a person would be unfit to drive may help the individual better recognize impairment in his or her own driving capabilities, as well as provide an opportunity to assess his or her judgment and insight. In addition, it might open up discussion to reach some common ground.

Many older adult drivers are able to identify peers whose driving they consider unsafe, yet may not have the insight to recognize their own unsafe driving habits. It can be helpful to ask older adults if they have friends with whom they are afraid to drive and why.

It's important to encourage older adult drivers to begin to think about what to expect when their driving abilities begin to decline and to let them know that many people make the decision to restrict or stop driving when safety becomes a concern. Older adult drivers should be encouraged to obtain a second opinion if the results were borderline or questionable and they feel additional consultation would be helpful.

- Help the older adult driver identify support systems. Ask him or her to list family members, faith communities, neighbors, etc., who are able and willing to help with transportation. This may help the older adult driver become aware of a supportive network and feel more at ease when searching for alternative transportation. Some communities may now have more affordable transportation than taxis such as Uber and Lyft.
- Assist the older adult driver to consider the positives of this decision—an opportunity to assert control over a limitation. Often, discussion of relinquishing driving privileges tends to focus on the negative aspects of driving cessation, such as “losing independence” or “giving up freedom.” Help the older adult driver view this as a step

in health promotion and safety for themselves and others. Use phrases such as “it’s time to retire from driving” and point out that older adults can still stay connected by requesting rides from caregivers and using community services. It may be helpful to point out that the older driver has quite likely been giving rides to others throughout their driving career, and they may now allow others to return the favor. Another positive is that expenses will be lower without the financial responsibility of maintaining a vehicle.

- Refer the older adult driver to a social worker or clinical team member. Older adult drivers may need additional help in securing resources and transitioning to a life without driving. Social workers often provide supportive counseling to older adults and caregivers, assess the individual’s psychosocial needs, assist in locating and coordinating community services and transportation, and enable older adults to maintain independence and safety while preserving quality of life. The National Association of Social Workers Register of Clinical Social Workers is a valuable resource for finding local social workers who have met national, verified, professional standards for education, experience, and supervision. Information can be ordered and the online register accessed at www.helpstartshere.org/find-a-social-worker. Local hospitals are another resource for social workers, and referral sources include the Area Agency on Aging or the Alzheimer’s Association.

The Older Adult Driver with Symptoms of Depression

Depression may result from a combination of factors such as diminished health, social isolation, or feelings of loss. An older adult driver suspected of being depressed (see Table 6.4) should have a full assessment to determine the most appropriate treatment. Older adults and caregivers should be educated about symptoms of depression and available treatment options. Referring the older adult to individual or group therapy, and/or to social/recreational activities may be considered. Pharmacologic treatment or referral to a mental health professional may also be appropriate. It is important to acknowledge that the older adult has suffered a loss and recognize that this may be an especially difficult time for him or her.

The Older Adult Driver who Lacks Decision-Making Capacity

When the older adult driver has significant cognitive impairment and/or lacks insight or decision-making capacity (e.g., in certain cases of dementia, stroke, etc.), it is imperative to obtain the help of the caregiver, surrogate decision-maker, or guardian, if available. Caregivers play a crucial role in encouraging the older adult to stop driving and to help the individual find alternatives. Clinicians should inform caregivers that the clinical team will support and assist their efforts in any way possible.

In rare instances, it may be necessary to appoint a legal guardian for the older adult. In turn, the guardian may forfeit the older adult’s car and license on behalf of the individual’s safety. These actions should be taken only as a last resort. From a practical standpoint, hiding,

donating, dismantling, or selling the car may also be useful in these difficult situations.

The Older Adult Driver Shows Signs of Self-Neglect or Neglect

Older adults may be unable to secure resources for themselves and may be isolated, lacking sufficient support from family, friends, or an appointed caregiver. If the older adult does not have the capacity to care for himself or herself, or caregivers are unable to provide adequate care, signs of neglect or self-neglect (see Table 6.5) may be evident.

If neglect or self-neglect is suspected, Adult Protective Services (APS) should be involved. Neglect is the failure of a caregiver to fulfill his or her caregiving responsibilities, whether because of willful neglect or as a result of disability, stress, ignorance, lack of maturity, or lack of resources. Self-neglect is the inability to provide for one's own essential needs. APS will investigate for neglect, self-neglect, or abuse of the older adult. APS can secure services such as case planning, monitoring, and evaluation, and can arrange for medical, social, economic, legal, housing, law enforcement, and other emergency or supportive services. Contact information for each State office can be obtained by calling the Eldercare Locator at 800-677-1116.

Table 6.1 Transportation Alternatives

- Walking
- Train/subway
- Bus
- Taxi/Uber-like services
- Family and friends
- Community transportation services
- Hospital shuttles
- Medi-car
- Delivery services
- Volunteer drivers (e.g., church, synagogue, temple, mosque, community centers)
- Private for-profit senior care services

Table 6.2 Family/Caregiver Assistance

- Encourage family members and caregivers to promote the health and safety of the older adult by endorsing clinician recommendation and assisting in securing needed transportation.
- Include caregivers in the mobility counseling process.
- Provide resources to caregivers.
- Provide copies of the *How to Assist the Older Driver* resource sheet (Appendix B).
- Look for signs of caregiver burnout.

- Keep the communication door open to caregivers.
- In the case of cognitive impairment when it is believed the older adult driver does not have decision-making capacity (e.g., lack of insight), communication with a family member or caregiver to reinforce recommendations is imperative.
- Recognize that if family members or caregivers depend on the older adult driver for transportation, the situation may require more time, counseling, and support to meet everyone's needs.

Websites (Accessed July 2015)

- **AAA Foundation** (www.aaafoundation.org/senior-drivers)
The emphasis of the AAA Foundation is the behaviors and safety-related attitudes of drivers 65 and older.
- **Alzheimer's Association** (www.alz.org/care/alzheimers-dementia-and-driving.asp)
The Alzheimer's Association provides links to driving counseling support for caregivers.
- **American Occupational Therapy Association** (www.aota.org)
Locate an occupational therapists able to conduct driving assessment and locations by ZIP code.
- **Family Caregiver Alliance** (www.caregiver.org)
This organization supports and sustains the important work of families nationwide caring for loved ones with chronic, disabling health conditions.
- **The Health in Aging Foundation** (www.HealthinAging.org)
This Foundation was established by the American Geriatrics Society to bring the knowledge of geriatrics health care professional to the public, with a wide range of resources.
- **Independent Transportation Network America**
(www.itnamerica.org/what-we-do/our-services)
A national non-profit transportation system for America's aging population. The ITN service is membership-based - people 60 and older and visually impaired adults are eligible to join.
- **National Association of Area Agencies on Aging** (www.n4a.org/about-n4a)
Area Agencies on Aging are a leading aging issues resource and national network.
- **National Association of Social Workers** (www.socialworkers.org)
Locate a social worker by ZIP code.
- **National Center for Senior Transportation** (www.seniortransportation.net)
The National Center on Senior Transportation strives to increase transportation options for older adults to support their ability to live independently in their homes and communities throughout the United States. It is administered by Easter Seals Inc. in partnership with the National Association of Area Agencies on Aging.

- **National Highway Traffic Safety Administration**
(www.nhtsa.gov/Driving+Safety/Older+Drivers)
NHTSA's priorities are to reduce the number of deaths and injuries by getting drivers, pedestrians, and cyclists to change their behaviors once they are behind the wheel or on the streets. See "Talking With Older Drivers About Safe Driving."
- **National Volunteer Transportation Center**
(www.NationalVolunteerTransportationCenter.org)
The National Volunteer Transportation Center was created to support existing and emerging volunteer transportation programs and services across the country.
- **Rides in Sight.** A free Transportation Referral Service (www.ridesinsight.org) or call toll free –855-607-4337. Assists the individual in finding a transportation program in the older adult's area. Can be searched on line or the number will be answered by a person during business hours.

Table 6.3 Tips to Reinforce Driving Cessation

- Give the older adult and caregiver a written prescription that states: "Do Not Drive, For Your Safety and the Safety of Others." This acts as a reminder for the older adult and also emphasizes the strength of your message.
- Remind the older adult that this recommendation is for his or her safety and for the safety of other drivers.
- Ask the older adult driver how he or she might feel if he or she were to get in a crash and injure themselves or someone else.
- Point out the economic advantages of not having a car, which will eliminate many expenses, including gas, maintenance (oil changes, tires, tune-ups), insurance, registration/license fees, financing expenses, and depreciation of the car's value.
- Have a plan in place that involves caregiver support for alternative transportation.

Table 6.4 Questions to Assess for Major Depressive Disorder (adapted from *DSM-5*)¹³

These questions are in regard to most of the day or nearly every day and are not related to another medical illness.

- Has your mood been sad, empty, or hopeless?
- Have you lost enjoyment in all or most activities?
- Have you noticed any weight changes?
- Have you noticed any changes in sleeping habits or concentration?
- Have you noticed a lack of energy or slower movement?
- Have you noticed feelings of worthlessness or recurrent ideas of death?

Table 6.5 Signs of Neglect or Self-Neglect in Older Adults

- An injury that has not been properly treated
- Symptoms of dehydration and/or malnourishment
- Weight loss
- Soiled clothing
- Recurrent falls with or without injuries
- Evidence of inadequate or inappropriate administration of medications
- Spoiled or outdated food in the refrigerator
- Loss of income from difficulty with finances

Table 6.6 Sample Letter

December 23, 2016
Mr. Clayton Phillips
123 Lincoln Lane
Sunnydale, XX 55555

Dear Mr. Phillips:

I am writing to follow-up on your clinic visit of December 1, 2016. You'll recall we talked about your driving safety. I tested your vision (eyes), strength, movement, and thinking skills, and reviewed your health problems and medicines. I recommended you stop driving because of your poor vision, muscle weakness, and slowed reaction time.

I know that driving is important to you, and I know it is hard to give up. But your safety is more important. To help you get around, your son and your friends have offered to help you. You can also use the special bus in your neighborhood. The handout *How to Assist the Older Driver* (enclosed) has some other ideas we talked about. I am also sending a copy of these materials to your son so that you two can discuss this plan together.

I want to make sure you can still visit your friends and go other places without a car. It is important for you to maintain your connection with the community. Please see me again in one month—we will talk about how this plan is working for you.

In a State that has mandatory reporting, consider adding:

As we discussed, the State of _____ requires me to notify the State licensing agency of people who have medical conditions that might affect driving safety. Because I am required by law to do this, I have given your name to the _[State name]_ licensing agency. The licensing agency will send you a letter in a few weeks to discuss your driver's license.

In a State that has voluntary reporting, consider adding:

It is very important that you do not drive, because you are putting yourself and the public at risk. If you continue to drive, I will need to submit your name to the State licensing agency for an evaluation and possible revocation of your license.

Please call my office if you have any questions. I look forward to seeing you next month.

Sincerely,

Physician

Enc: *How to Assist the Older Driver*

cc: Your son

Note: The sample letter in Table 6.6 has been written at a grade 7 level according to Flesch-Kincaid Readability (12/2014).

References

1. Betz, M., E., Jones, V. C., & Lowenstein, S. R. (2014). Physicians and advance planning for “driving Retirement”. *American Journal of Medicine*, 127, 689–690.
2. Meuser, T. M., Berg-Weger, M., Niewoehner, P. M., Harmon, A. C, Kuenzie, J. C., Carr, D. B., & Barco, P. P. (2012). Physician input and licensing of at-risk drivers: a review of all-inclusive medical evaluation forms in the US and Canada. *Accident Analysis & Prevention*, 46, 8–17.
3. Broberg, T., & Willstrand, T. D. (2014). Safe mobility for elderly drivers: considerations based on expert and self-assessment. *Accident Analysis & Prevention*, 66, 104–113.
4. Naumann, R. B., West, B. A., & Sauber-Schatz, E., K. (2014). At what age do you think you will stop driving? Views of older U.S. adults. *Journal of the American Geriatrics Society*, 62, 1999–2000.
5. Betz, M., E., Jones, J., Petroff, E., & Schwartz, R. (2013). “I wish we could normalize driving health”: A qualitative study of clinician discussions with older drivers. *Journal of General Internal Medicine*, 28, 1573–1580.
6. Brummel-Smith, K., Munn, J. C., & Danforth, D. D. (2014). Interprofessional team care. In R. J. Ham et al (eds). *Ham’s Primary Care Geriatrics*. 6th Edition. Philadelphia: Elsevier, Inc.
7. Berg-Weger, M., Meuser, T. M., Stowe, J. (2013). Addressing individual differences in mobility transition counseling with older adults. *Journal of Gerontological Social Work*, 56, 201–218.
8. Moore, I. Assessing the geriatric patient: planning for transitions of care. *Consultant Pharmacist*, 29, 369–374.
9. Curl, A. L., Stowe, J. D., Cooney, T. M., & Proulx, C. M. (2014). Giving up the keys: how driving cessation affects engagement in later life. *Gerontologist*, 54, 423–433.
10. The Hartford Financial Services Group, Inc. (2015). You and Your Car: A Guide to Driving Wellness. Retrieved from the Hartford website at http://hartfordauto.thehartford.com/UI/Downloads/You_and_Your_Car.pdf
11. Beverly Foundation. (n.a.) Transportation and Dementia (Fact Sheet, Series 1, No. 8). Retrieved from the Beverly Foundation website at <http://beverlyfoundation.org/wp-content/uploads/Fact-Sheet-8-transportation.Dementia.pdf>.

12. Brown, P. J., Roose, S. P., Fieo, R., Liu, X., Rantanen, T., Sneed, J. R., ... Avlund, K. (2014). Frailty and depression in older adults: a high-risk clinical population. *American Journal of Geriatric Psychiatry*, 22, 1083–1095.
13. American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders*, 5th Edition. [Known as DSM-V]. Washington, DC: American Psychiatric Association.

CHAPTER 7 ETHICAL AND LEGAL ISSUES

Key Points

- Laws, regulations, and policies vary not only by State but also by local jurisdiction and are subject to change. Health care professionals should seek legal advice on specific issues or questions.
- It is important to know and comply with State requirements to avoid being subject to a third-party lawsuit.
- Some States (CA, DE, NJ, NV, OR, PA) have mandatory reporting requirements that may give rise to liability for failure to report.
- The ethical responsibility to maintain patient confidentiality as well as the ethical responsibility to public safety is not limited to physicians; all health care professionals have the same obligation.
- Patient permission should be obtained before contacting caregivers, and this should be documented in the patient's health record. If the patient maintains decisional capacity and denies permission, their wishes must be respected.

Your next patient is Mrs. Allen, a 78-year-old woman who is accompanied by her daughter. The daughter reports that her mother, who lives alone, has become increasingly forgetful, repeats herself within minutes, and has difficulty dressing herself, performing personal hygiene tasks, and completing household chores. She is particularly concerned about her mother's daily trips to the grocery store two miles away. Mrs. Allen has become lost while on these trips and, according to the store manager, has handled money incorrectly. Dents and scratches have appeared on the car without explanation. Mrs. Allen's daughter has asked her mother to stop driving and tried to take the car keys, but Mrs. Allen responds with anger and resistance. On previous visits you have recommended that she consider alternatives to driving. The daughter would like to know how to manage her mother's long-term safety and health, especially how to address the driving issue.

This chapter provides a general overview to assist clinicians to understand the process, including their ethical and legal responsibilities, for reporting unsafe drivers to their State licensing agency. Although some of the issues addressed are inherently ethical and/or legal, this chapter is not to be construed as providing legal advice. The views, discussion, conclusions, and legal analysis are those of the authors and do not represent the opinions, policies, or official positions of the National Highway Traffic Safety Administration, the AGS and do not replace local legal advice and review of State laws and local statutes. It is important for physicians to seek out legal advice in their State on specific issues or questions that may arise with an individual patient.

Older adults receive services in multiple settings from all types of professionals, including all members of the clinical team (medicine, nursing, pharmacy, social work, occupational therapy, etc.). Most existing legal guidance for older adult drivers refers specifically to physicians, although all clinical professionals have similar ethical duties and obligations. The following discussion specifically cites physicians but the principles discussed should be adopted by the entire clinical team.

Clinician: *Mrs. Allen, I understand you drove yourself to the appointment today. This worries me. At our last visit, I recommended you retire from driving. Please share the reason you drove here today.*

Mrs. Allen: *Well, I don't understand why you're so concerned. I've never gotten into a car crash. My driving is fine and, frankly, I don't think you have any right to tell me not to drive.*

Clinician: *It sounds like you are frustrated, and I can't imagine how difficult it must be for you to adjust to a life without driving. It's not an easy choice to make; however, it's the best choice for your health and safety, and as your health care provider, that is my primary concern. I want to help make this easier for you. Your Rapid Pace Walk (15 seconds) and MoCA test results (score 18/30) show that your responses are not as sharp as they need to be for you to drive safely. Let's talk about some of your concerns regarding retiring from driving.*

Laws, regulations, and policies vary not only by State but also by local jurisdiction. They are also subject to change, and the State licensing agency should be contacted for the most up-to-date information. For a State-by-State list of licensing agency contact information and additional resources for locating licensing requirements and renewal criteria, reporting procedures, etc., see Chapter 8.

Clinician: *Mrs. Allen, when do you think it's an appropriate time for a person to stop driving?*

Mrs. Allen: *I suppose when they drive unsafely or are a threat to others on the road.*

Clinician: *That is an excellent observation, and I would agree with you.*

Mrs. Allen: *Well, a friend of mine doesn't drive very well. He drives all over the road and runs red lights. I won't get in the car with him anymore because I worry about what may happen.*

Clinician: *That is indeed a scary situation for your friend and others on the road, too. It's great that you're aware of the potential danger and know how to ensure your own safety. I'm wondering if there's someone you trust who would tell you when they thought it was unsafe for you to continue driving?*

The case studies in this chapter serve to illustrate the range of opinions in attempting to fairly define the scope of the physician's responsibility to report impaired drivers. In addition, they consider society's efforts to provide a safe environment for its citizens.

On further evaluation, you diagnose Mrs. Allen with Alzheimer disease. It is readily apparent that her condition has progressed to the extent that she can no longer drive safely and that rehabilitation is not likely to improve her driving safety. You tell Mrs. Allen that she must stop driving for her own safety and that of others on the road. You also explain that the State reporting law requires physicians to notify the State licensing agency of your diagnosis. Initially, Mrs. Allen does not understand but when you specifically tell her that she can no longer drive herself to the grocery store every day, she becomes agitated and abusive, screaming, "I hate you!" and "I'm going to sue you!" Her daughter understands your decision to report Mrs. Allen to the State licensing agency, but is now concerned that her mother will encounter problems if she attempts to drive without a license, since she no longer has the ability to drive. Mrs. Allen's daughter asks if it is absolutely necessary for you to report her mother. What do you say?

Many physicians are uncertain of their legal responsibility, if any, to report unsafe drivers to their State licensing agency.^{1,2} The situation is further complicated by the risks of damaging the physician-patient relationship, violating patient confidentiality, and potentially losing patients. As a result, physicians are often faced with a dilemma: should they report the unsafe driver, or should they forego reporting and risk being liable for any potential patient or third-party injuries for failing to report? Furthermore, how should physicians engage caregivers to lessen the burden of a driving restriction or cessation?

Ethical Duties

Current legal and ethical debates highlight duties of the physician that are relevant to the issue of driving. These include the duties to protect patient health as well as maintain patient confidentiality.

Duty to Protect

The Patient: Protecting the patient's physical and mental health is considered the physician's primary responsibility. This includes not only treatment and prevention of illness but also caring for the patient's safety. With regard to driving, physicians should advise and counsel patients about medical conditions and possible medication adverse effects that may impair the ability to drive safely and document this discussion in the medical record. Some States have mandatory reporting requirements that may give rise to both civil and criminal liability for failure to report.³ For example, wording in the Pennsylvania law has led the Pennsylvania State licensing agency to conclude that physicians who do not report "could be held responsible as a proximate cause of an accident resulting in death, injury or property loss caused by your patient; the

Pennsylvania statute further states that providers who do not comply with their legal requirement to report may be convicted of a summary criminal offense.”⁴ Case law illustrates that failure to advise patients about such medical conditions and medication adverse effects can be considered negligent behavior, making the physician liable for monetary damages.⁵

The Public: In addition to caring for their patients’ health, physicians may, in certain circumstances and jurisdictions, have some responsibility for protecting the safety of the public.^{6,7} In certain States, physicians have been found liable for third-party injuries because they failed to advise their patients about medical conditions, medication adverse effects, or medical devices that may impair driving performance.^{8–10}

Maintain Patient Confidentiality

Physicians: Patient confidentiality is the right of an individual to have personal, identifiable medical information kept private. These protections are found in the federal Health Insurance Portability and Accountability Act of 1996 (HIPAA).¹¹ All health care professionals have a legal duty to protect private patient information from disclosure to anyone, including the patient’s family, attorney, or the government without authorization from the patient.¹²

HIPAA encourages the free exchange of information between the health care professional and the patient, allowing the patient to describe symptoms for diagnosis and treatment.¹³ Individuals may be less likely to seek treatment, disclose information for effective treatment, or trust the health care professional unless confidentiality is ensured.¹⁴

However, nondisclosure requirements are not absolute. There may be public policy reasons to breach confidentiality, such as removing unsafe drivers from the road.¹² Thus, patient confidentiality may not necessarily protect the physician in the impaired driver situation.¹⁴

Other Health Care Professionals: The ethical responsibility to maintain patient confidentiality is not limited to physicians; all health care professionals have the same obligation.¹⁵ Patient confidentiality is crucial within the health care professional–patient relationship, because it encourages the free exchange of information allowing the patient to describe symptoms for diagnosis and treatment.¹³ Without belief that their care is confidential, patients may not trust their health care professional and, thus, be less likely to disclose information for effective treatment.¹⁴ This need, however, is not absolute.¹⁶ A good example of health care professional standards for the treatment of older adult patients can be found at the American Society of Consultant Pharmacists (www.ascp.com/articles/quality-standards-and-practice-principles-senior-care-pharmacists).¹⁷

Concerns about Reporting

A Canadian study explored physicians' attitudes on medical fitness to drive and found that although most medical professionals would report unfit drivers, they believed such action could adversely affect the confidentiality expectations within the physician-patient relationship.¹⁸ Physicians have raised concerns about mandatory reporting, stating it can violate privacy, compromise the ability to counsel patients, and negatively impact the physician-patient relationship.¹⁹ Some physicians have suggested that mandatory reporting has the potential to discourage patients from seeking health care.²⁰

In the six States that have mandatory reporting requirements, studies show physicians are more likely to report.²¹ Unless required by law to report, physicians may choose not to do so in certain situations.

Immunity and Confidentiality

Of the 43 States with voluntary reporting laws, 18 currently do not protect reporting health professionals from liability for civil damages.²² In 1999, the National Committee on Uniform Traffic Laws and Ordinances (now disbanded) developed a "Model Driving Impairment Law" that suggested physician immunity from civil liability should be an important component of any law.^{23, 24}

Adherence to State Reporting Laws

Each State has its own reporting laws. For a State-by-State listing of licensing agency contact information and other resources for licensing requirements, see Chapter 8. Note that information may change over time, and the State licensing agency should always be contacted for the most up-to-date information.

In States without laws mandating physicians to report patients to the State licensing agency, physicians should have written patient releases that comply with HIPAA before disclosing medical information. In these States, physicians who disclose medical information without patient authorization may be liable for breach of confidentiality. However, failure to disclose may make the physician liable to third parties who are injured by the patient.²⁵ This presents a "take it or leave it" Hobson's choice,* but ultimately safety of the patient and the public should come first.

*Thomas Hobson (circa 1544–1630) kept a stable and required every customer to take either the horse nearest the stable door or take no horse at all. Thus, a "Hobson's Choice" is given to one asked to choose between two undesirable alternatives.

Balancing Ethical and Legal Responsibilities

Balancing competing ethical and legal duties can be problematic. The following strategies may be helpful.

Counsel Patients and Caregivers

Patients should be advised of medical conditions, medications, medical devices, and procedures that may affect driving performance. (For a reference table of such medical conditions and medications, with recommendations for each, see Chapter 9.) If the patient gives permission, his or her caregivers should be involved in the counseling process whenever appropriate. Caregivers included in the process are more likely to assist the patient with the changes a loss of license will bring. Losing the driver's license has significant psychological consequences, because the ability to drive is inexorably intertwined with the sense of independence.

Driving cessation has other major consequences besides loss of autonomy. The older adult's ability to conduct the business of daily living is impaired, as is his or her ability to participate in social activities or volunteering. Therefore, social isolation is likely. Caregivers are also negatively impacted, because they are expected to fill in many of the gaps that will inevitably arise as a result of the older adult's retirement from driving. These risks need to be recognized and weighed versus the concerns of public safety.

If the older adult does not have decision-making capacity (e.g., due to Alzheimer disease), this information should be given to a surrogate decision-maker.

Recommend Driving Cessation

As discussed in previous chapters, clinicians should recommend driving cessation for patients believed to be unsafe drivers who have a condition(s) likely to affect driving safety but unlikely to improve with available medical treatment or with an adaptive device or technique. As always, clinical judgment should be based on the older adult's driving abilities and not on age per se. This recommendation should be documented in the patient's health record, and the clinician's office should have a system to check on compliance with recommendations.

Know and Comply with State Reporting Laws

Physicians must know and comply with their State's reporting laws (see Chapter 8). Physicians who fail to follow these laws may be liable for patient and third-party injuries and could face civil or criminal charges as well.

In States that have a mandatory medical reporting law, the State licensing agency's official form should be used to report the required medical conditions. In States that have a voluntary medical reporting law, the State licensing agency's official form can be used or any other reporting guidelines. Some States provide civil immunity if professionals report in good faith. Patient consent, if any, should be documented. If the State licensing agency's guidelines do not indicate what patient information must be reported, only the minimum information necessary to show that the patient may be an unsafe driver should be provided.

Reduce the Impact of Breaching Patient Confidentiality

In adhering to State reporting laws, physicians may need to breach patient confidentiality. However, several measures can be taken to reduce the impact on the physician-patient relationship.

Inform the Patient of Notice to the State Licensing Agency: Before reporting a patient to the State licensing agency, physicians should inform the patient of their intent and explain that it is the ethical, and in some cases, legal responsibility of the physician to make a referral to the State licensing agency. Describing the kind of follow-up that can be expected from the State licensing agency is also advised. The patient should be assured that out of respect for his or her privacy, only the minimum information required will be disclosed and that all other information will remain confidential. When submitting a report to the State licensing agency, only the minimum information necessary (or required by the reporting guidelines) should be provided to establish that the patient may be unsafe to drive.

Even in States that offer anonymous reporting or reporter confidentiality, being open and honest with patients is a good idea. It may help to remind patients that the physician does not determine whether they are licensed to drive and that this decision is ultimately made by the State.

Providing patients with as much information as possible, perhaps including a copy of the State licensing agency report, can involve them in the process and give them a greater sense of control. In addition, patient permission should be obtained before contacting caregivers, and this should be documented in the patient's health record. If the patient maintains decisional capacity and denies permission, their wishes must be respected.

Document Diligently: All efforts to assess and maintain the patient's safety and that of the public should be documented in the patient's health record. In the event of a patient or third-party crash injury, good documentation may protect the physician from civil liability.

Physicians should protect themselves legally by documenting their efforts, discussions, recommendations, and any referrals for further testing in the patient's health record.²⁶ In other words, all the steps performed in the *Plan for Older Drivers' Safety* (PODS) (see Chapter 1) should be documented, including:

- Any direct observations of the patient's functional status, red flags as described in PODS, or driving history that lead the physician to believe that the patient may be at risk of unsafe driving.
- Any counseling specific to driving (e.g., documenting that the patient is aware of the warning signs of hypoglycemia and its effects on driving performance).
- Formal assessment of the patient's driving-related functions (e.g., documenting that the patient has undergone the Clinical Assessment of Driving Related Skills (CADReS) and including the CADReS scoring sheet in the patient's health record).

- Any medical interventions and referrals that have been made to improve the patient's function, as well as any repeat testing to measure improvement.
- A copy of the driver rehabilitation specialist (DRS) report if the patient has undergone driver assessment and/or rehabilitation.
- The physician's recommendation on whether the patient should continue driving or cease driving. In the case of a cease driving recommendation, a summary of interventions (e.g., "sent letter to patient to reinforce recommendation," "discussed transportation options and gave copy of 'Patient Resource Sheet'," "contacted family members with patient's permission," "reported patient to State licensing agency with patient's knowledge") should be included. Copies of any written correspondence should also be included in the patient's health record.
- Follow-up for degree of success in using alternative transportation options and any signs of social isolation and depression, including any further interventions, such as referral to a social worker, geriatric care manager, or mental health professional.

Additional Legal and Ethical Concerns

Other particularly challenging situations may arise. The following examples provide some possible actions that may be used as a guide.

Situation 1: The patient threatens to sue if he or she is reported to the State licensing agency.

A patient's threat to sue should not deter the physician from complying with State reporting laws. If a patient threatens to sue, physicians can take several steps to protect themselves in the event of a lawsuit:

- Know if your State has passed legislation specifically protecting health care professionals against liability for reporting unsafe drivers in good faith¹⁶ (see Chapter 8).
- Understand that even in the absence of such legislation, physicians generally run little risk of liability for following mandatory reporting statutes in good faith. Consult your attorney or malpractice insurance carrier to determine your degree of risk.
- Make certain the reasons for believing that the patient is an unsafe driver have been clearly documented.

Be aware that physician-patient privilege does not preclude the physician from reporting the patient to the State licensing agency. Physician-patient privilege, which is defined as the patient's right to prevent disclosure by the physician of any communication between the physician and patient, does not apply in cases of mandatory reporting. Patients can be reminded that physicians do not determine licensing. Ultimately, this is the responsibility of the State, and thus the State makes the final decision on determining whether the patient can continue to drive.

Situation 2: The patient is an unsafe driver in a State without State reporting laws.

In this situation, the physician's first priority is to ensure that the unsafe driver does not drive. If this can be accomplished without having the patient's license revoked, then there may be no need to report the patient to the State licensing agency. Before reporting a patient, physicians may address the risk of liability for breaching patient confidentiality by following the steps listed under Situation 1.

However, if the patient continues to refuse to stop driving, then physicians must consider which is more likely to cause the greatest amount of harm: breaching the patient's confidentiality versus allowing the patient to potentially injure himself or herself or third parties in a motor vehicle crash.

Situation 3: The patient's license has been suspended by the State licensing agency for unsafe driving, but the physician is aware that he or she continues to drive.

This patient is violating the law, and several questions are raised: Is the physician responsible for upholding the law at the expense of breaching patient confidentiality? Because the license has been revoked by the State licensing agency, is the driving safety of the patient now the responsibility of the State, the physician, or both?

Several steps can be taken in this situation:

- Ask the patient why he or she continues to drive. Address the specific causes brought up by the patient (see Chapter 6 for recommendations). With the patient's permission, caregivers should be involved in finding solutions, such as alternative methods of transportation.
- Ask the patient if he or she understands that continuing to drive is breaking the law. Reiterate concerns about the patient's safety, and ask how he or she would feel about causing a crash and potentially being injured or injuring someone else. Discuss the emotional burden a car crash would cause the patient, his or her family, and all others involved.
- Discuss the financial and legal consequences of being involved in a crash without a license or auto insurance. Many clinicians remind patients and families/caregivers of the possibility of their financial liability for any injuries caused by driving.
- If the patient is cognitively impaired and lacks insight into this problem, the issue must be discussed with the individual who holds decision-making authority for the patient, if the patient has a designated decision maker. If not, the patient and caregiver(s) should pursue the process of appointing one. These parties should understand their responsibility to prevent the patient from driving.
- If the patient continues to drive and the State has a mandatory reporting law, physicians must adhere to the law by reporting patients who are unsafe drivers (even if the patient

has been reported previously). If the State does not have a mandatory reporting law, the physician should base the decision to report as in Situation 2 (see above). The State licensing agency, as the agency that grants and revokes the driver's license, will follow up as it deems appropriate.

Situation 4: The patient threatens to find a new physician if reported to the State licensing agency.

Although unfortunate, this situation should not prevent physicians from caring for the patient's health and safety. In addition, physicians must adhere to State reporting laws, regardless of such threats.

Several strategies may help diffuse this situation:

- Reiterate the process and information used to support the recommendation that the patient stop driving.
- Reiterate concern for the safety of the patient, any passengers, and others on the road.
- Remind the patient that providing him or her with the best possible health care includes safety measures of all types. State that driving safety is as much a part of patient care as encouraging patients to keep smoke detectors in the house and have regular physical check-ups.
- Encourage patients to seek a second opinion, if appropriate. A DRS may evaluate the patient if this has not already been done, or the patient may consult another physician.
- If the State licensing agency follows up on physician reports with driver retesting, inform the patient that just as it is the physician's responsibility to report the patient to the agency, it is the patient's responsibility to prove his or her driving safety to the agency. Emphasize that the State licensing agency makes the final decision, and that only the State can legally revoke a driver's license. Remind the patient that everything medically possible has been done to help him or her pass the driver test.
- As always, maintain professional behavior by remaining matter-of-fact and not expressing hostility toward the patient, even if he or she ultimately makes the decision to seek a new physician.

Patient Resources

*Driving Safely While Aging Gracefully*²⁷, a brochure available from the National Highway Traffic Safety Administration, can help older adults assess whether they should still be driving. There is also a Drive Well Toolkit²⁸ online and *Getting Around: Alternatives for Seniors Who No Longer Drive*²⁹, another brochure designed to help families cope with an older adult who should not be driving. Physicians may wish to keep a supply of these documents on hand. Additional resources are discussed in Chapter 6 and listed in Appendix B.

Glossary of Terms

Before consulting the reference list in Chapter 8, it will be helpful to be familiar with the following terms and concepts (Table 7.1).

Table 7.1 **Glossary of Terms**

Anonymity and legal protection	Several States offer anonymous reporting and/or immunity for reporting in good faith. More than half of all States will maintain the confidentiality of the reporter, unless otherwise required to disclose by a court order. ³⁰
Driver rehabilitation programs	These programs, run by driver rehabilitation specialists (DRS), help identify at-risk drivers and improve driver safety through adaptive devices and compensatory techniques. Drivers typically receive a clinical evaluation, on-road assessment, and, if necessary, vehicle modifications and training. (For more information on driver assessment and rehabilitation, see Chapter 5.)
Duty to protect	In certain jurisdictions, physicians have a legal duty to warn the public of danger their patients may cause, especially in the case of identifiable third parties. ⁶ With respect to driving, mandatory reporting laws and physician reporting laws provide physicians with guidance on their duty to protect.
Good faith	Honesty and respect in all professional interactions ³¹
Immunity for reporting	Many States exempt physicians from liability for civil damages brought by the patient if the physician previously reported the patient to the State licensing agency.
Medically impaired driver	A driver who is suffering from cognitive and/or functional impairments likely to affect the ability to safely operate a motor vehicle.
Mandatory medical reporting laws	In some States, physicians are required to report patients who have specific medical conditions (e.g., epilepsy, dementia) to their State licensing agency. These States provide specific guidelines and forms that can be obtained through the State licensing agency.

Table 7.1 Glossary of Terms

Medical Advisory Boards (MABs)	MABs generally consist of local or consultant physicians who work in conjunction with the State licensing agency to determine whether mental or physical conditions may impair an individual's ability to drive. Some MABs specify mitigation that would permit continued licensure. MABs vary among States in size, role, and level of involvement.
Patient confidentiality	The right of an individual to have personal, identifiable medical information kept private.
Physician reporting laws	Some States require physicians to report "unsafe" drivers to the State licensing agency, with varying guidelines for defining "unsafe." The physician may need to provide the patient's diagnosis and any evidence of a functional impairment that can affect driving (e.g., results of neurologic testing) to prove that the patient is an unsafe driver. ³²
Physician liability	Refers to the legal duty of the physician to report his or her patient's status as an at-risk driver to the state licensing agency. Failure to report (negligence) can result in the physician being held liable (responsible) for civil damages caused by the patient's car crash. ³³
Renewal procedures	License renewal procedures vary by State. Some States have age-based renewal procedures, i.e., at a given age, the State may reduce the time interval between license renewal, restrict the ability to obtain license renewal by mail, require specific vision ability and knowledge of traffic laws and signs, and/or require on-road testing. Very few States require a physician's report for license renewal. ³⁴

Table 7.1 **Glossary of Terms**

Restricted driver's license	Some States offer a restricted license as an alternative to revoking a driver's license. Typical restrictions include prohibiting night driving, limiting driving to a certain distance from home, requiring adaptive devices, and shortening the renewal interval. The efficacy of these types of restrictions has not been studied.
Third party	The generic legal term for any individual who does not have a direct connection with the physician but who might be affected by it, e.g., anyone injured other than the patient.

References

1. Kelly, R., Warke, T., & Steele, I. Medical restrictions to driving: the awareness of patients and doctors. *Postgraduate Medical Journal*, 75, 537–539.
2. Miller, D., & Morley J. (1993). Attitudes of physicians toward elderly drivers and driving policy. *Journal of the American Geriatrics Society*, 40, 722–724.
3. OR. REV. STAT. § 807.710 (2001).
4. Title 75 PA. CODE § 1518(b) The Vehicle Code (stating physicians are immune from any civil or criminal liability if they **do report patients** 15 years of age or older who have been diagnosed as having a condition that could impair his/her ability to safely operate a motor vehicle; but, if the physician does not report could, then, possibly be held responsible as a proximate cause of an accident resulting in death, injury, or property loss caused by the physician's patient. Also, **physicians who do not comply** with their legal requirement to report may be convicted of a summary criminal offense). Available at www.dmv.state.pa.us/pdotforms/fact_sheets/fs_pub7212.pdf.
5. *Gooden v. Tips*, 651 S.W.2d 364, 1983 Tex. App., 43 A.L.R.4th 139 (Tex. App. Tyler 1983) (case stating that physicians have a duty to warn patients that medications may impair driving but that physicians do not have a duty to control a patient's behavior). However, the Supreme Court of Texas significantly narrowed physicians' duties to third parties. In *Praesel v. Johnson*, 967 S.W.2d 391, 396 (Tex. 1998), the court noted that it had "generally limited the scope of the duty owed by physicians in providing medical care to their patients." The court "declined to impose on physicians a duty to third parties to warn an epileptic patient not to drive. Somewhat similarly that court "weighed the risk, foreseeability, and likelihood of injury against the social utility of the actor's conduct, the magnitude of the burden of guarding against the injury, and the consequences of placing the burden on the defendant," and also considered "whether one party would generally have superior knowledge of the risk or a right to control the actor who caused the harm." 967 S.W.2d at 397-98. For a general discussion on this topic see 43 A.L.R. 4th 153; 35 U. Mem. L.Rev. 173; See Comment: Driving on the center line: Missouri physician's potential liability to third persons for failing to warn of medication side effects (46 St. Louis L.J. 873); *Wilschinsky v. Medina*, 1989- NMSC-047, 108 N.M. 511, 775 P.2d 713, (N.M. 1989). (New Mexico case stating that the physician owed a duty of care to an individual harmed by the physician's patient, that the patient's duty specifically extended to persons the patient injured by driving a car from the doctor's office after being injected with drugs that were known to affect judgment and driving ability; the medical standards for administering drugs had to define the physician's duties of care). Limited by *Lester by & Through Mavrogenis v. Hall*, 1998-NMSC-047, 126 N.M. 404, 970 P.2d 590, 38 N.M. B. Bull. 2, 38 N.M. B. Bull. 11 2 (1998) (This Court did not extend the duty articulated in *Wilschinsky* to prescription cases under the case fact pattern.) See also *Brown v. Kellogg*, 2015-NMCA-006, 340 P.3d 1274 (N.M. Ct. App. 2014).

6. *Tarasoff v. Regents of University of California*, 17 Cal. 3d 425; 551 P.2d 334; 131 Cal. Rptr. 14 (Cal. 1976 Cal.); 83 A.L.R.3d 1166, 1976 (rehearing to the California Supreme Court upheld on the duty to warn and protect). In *Tarasoff*, the California Supreme Court held that, under certain circumstances, a therapist had a duty to warn others that a patient under the therapist's care was likely to cause personal injury to a third party. There the court said, "Although . . . under the common law, as a general rule, one person owed no duty to control the conduct of another, nor to warn those endangered by such conduct, the courts have carved out an exception to this rule in cases in which the defendant stands in some special relationship to either the person whose conduct needs to be controlled or in a relationship to the foreseeable victim of that conduct." (P. 435.) Applying that exception to the facts of *Tarasoff*, the court held that where a therapist knows that his patient is likely to injure another and where the identity of the likely victim is known or readily discoverable by the therapist, he must use reasonable care to prevent his patient from causing the intended injury. Such care includes, at the least, informing the proper authorities and warning the likely victim. However, the court did not hold that such disclosure was required where the danger presented was that of self-inflicted harm or suicide or where the danger consisted of a likelihood of property damage. Instead, the court recognized the importance of the confidential relationship which ordinarily obtains between a therapist and his patient, holding that ". . . the therapist's obligations to his patient require that he *not disclose a confidence unless such disclosure is necessary to avert danger to others . . .*" (*Tarasoff, supra*, p. 441; italics added). The holding in *Tarasoff* was questioned in *Mason v. IHS Cedars Treatment Ctr. of Desoto Tex., Inc.* (Tex. App. Dallas Aug. 15, 2001); criticized in *Gregory v. Kilbride*, 150 N.C. App. 601, 565 S.E.2d 685 (N.C. App. 2002) and *Tedrick v. Cmty. Res. Ctr., Inc.*, 235 Ill. 2d 155, 920 N.E.2d 220 (Ill. 2009); and superseded in part by Nebraska State statute in *Munstermann v. Alegent Health - Immanuel Med. Ctr.*, 271 Neb. 834, 716 N.W.2d 73, (Neb.2006). It should be noted that the *Tarasoff* ruling *per se*, upon which the principles of "Duty to Warn" and "Duty to Protect" are based, originally applied only in the State of California and now applies only in certain jurisdictions. The U.S. Supreme Court has not heard a case involving these principles. Many States have adopted statutes to help clarify steps that are considered reasonable when a physician is pre-sentenced with someone making a threat of harm to a third party. Tasman, A., Kay, J., Lieberman, J. A., Fletcher, J. (eds). *Psychiatry*, 1st ed. Philadelphia: W.B. Saunders Company; 1997, p 1815.
7. *Brisbane v. Outside in Sch. of Experiential Educ., Inc.*, 799 A.2d 89 (Pa. Super. Ct. 2002) (defining factors in a Pennsylvania case to determine the existence of a duty: (1) the relationship between the parties, (2) the social utility of the actor's conduct, (3) the nature of the risk imposed and foreseeability of the harm incurred, (4) the consequences of imposing a duty upon the actor, (5) the overall public interest in the proposed solution). Pennsylvania did not expand the duty of a parent to encompass supervision of adult children see *Kazlauskas v. Verrochio* (M.D. Pa. Oct. 27, 2014). Case questioned by *Bellah v. Greenson*, 81 Cal. App. 3d 614, 146 Cal. Rpt., 535, 1978, 17 A.L.R. 4th 1118 (Cal. App. 1st Dist. 1978). Explained by *Felty v. Lawton*, 1977 OK 109, 578 P.2d 757 (Okla. 1977). For a general discussion on this topic see A.L.R. 3d 1201; 46 Ca. Jur., Negligence Sections 10 and 212.

8. *Gooden v. Tips*, *supra* at FN 5; *Kaiser v. Suburban Transp. System*, 65 Wn.2d 461, 398 P.2d 14 (Wash.1965) (Washington case stating that a physician could be held liable due to the fact that a patient took medication completely unaware that it would have any adverse effect on him because the physician failed to warn his patient, whom he knew to be a bus driver, of the dangerous side effects of drowsiness or lassitude that may be caused by taking this particular medication). Superseded on other grounds by statute *State v. Fisher* (Wash. Ct. App. May 29, 2012).
9. *Calwell v. Hassan*, 260 Kan. 769, 925 P.2d 422 (Kan. 1996) (Kansas case stating that the doctor had no duty to protect bicyclists - a third party from his patient's actions because the patient who had a sleep disorder was aware of the problem and admitted to knowing that she should have stopped driving). *Adams v. Bd. of Sedgwick County Comm'rs*, 289 Kan. 577, 214 P.3d 1173 (Kan. 2009); *Wilson v. McDaniel*, 327 P.3d 1052, 2014 Kan. App. Unpub. (Kan. Ct. App. 2014) (cited in dissenting opinion). *Duvall v. Goldin*, 139 Mich. App. 342, 362 N.W.2d 275, (Mich. App. 1984) (Michigan case stating the physician was liable to third persons injured as it was foreseeable that a doctor's failure to diagnose or properly treat an epileptic condition could have created a risk of harm to a third party and that as a result of the patient's medical condition, caused an automobile accident involving the third persons). *Dawe v. Dr. Reuven Bar-Levav & Assocs., P.C.*, 485 Mich. 20, 780 N.W.2d 272 (Mich. 2010). Distinguished in *Singleton v. United States Dep't of Veterans Affairs*, 2013 U.S. Dist. (E.D. Mich. Aug. 15, 2013). *Myers v. Quesenberry*, 144 Cal. App. 3d 888, 193 Cal. Rptr. 733 (Cal. App. 4th Dist. 1983) (California case stating that if a physician knows or should know a patient's condition will impair the patient's mental faculties and motor coordination, a comparable warning is appropriate). Distinguished in *Greenberg v. Superior Court*, 172 Cal. App. 4th 1339, 92 Cal. Rptr. 3d 96 (Cal. App. 4th Dist.2009) *Schuster v. Altenberg*, 144 Wis. 2d 223, 424 N.W.2d 159 (Wis. 1988) (Wisconsin case stating that if it was ultimately proven that it could have been foreseeable to a psychiatrist, exercising due care, that by failing to warn a third person or failing to take action to institute detention or commitment proceedings someone would be harmed, negligence could be established). Distinguished by *Milwaukee Deputy Sheriff's Ass'n v. City of Wauwatosa*, 2010 WI App 95, 327 Wis. 2d 206, 787 N.W.2d438 (Wisc. App.2010) and *Hornback v. Archdiocese of Milwaukee*, 2008 WI 98, 313 Wis. 2d 294, 752 N.W.2d 862(Wisc. 2008).
10. *Joy v. Eastern Maine Medical Center*, 581 A.2d 418 (Me. 1990) (appeal after remand affirmed) (Mainecase stating that when the doctor knew, or reasonably should have known that his patient's ability to drive has been affected by treatment that the doctor provided, he had a duty to the driving public as well as to the patient to warn his patient of that fact). Distinguished by *Flanders v. Cooper*, 1998 ME 28, 706 A.2d 589 (Me. 1998).
11. Health Insurance Portability and Accountability Act of 1996 (HIPAA), Public Law 104-191. 45 C.F.R.§ 164.512(a)—*Uses and Disclosures Required by Law* (2000). Federal Register Vol. 65, No. 250, Thursday, December 28, 2000, Rules and Regulations, p 82811. Available at

www.hhs.gov/ocr/privacy/hipaa/administrative/privacyrule/prdecember2000all8parts.pdf (updated rule) www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title45/45cfr160_main_02.tpl

12. De Bord, J., Burke, W., & Dudzinski, D. (2013). Ethics in Medicine. Seattle: University of Washington School of Medicine. Retrieved from the university website at <https://depts.washington.edu/bioethx/topics/confiden.html> (2013). See also: American Society of Consultant Pharmacists (2011), Quality Standards and Practice Principles for Senior Care Pharmacists at www.ascp.com/articles/quality-standards-and-practice-principles-senior-care-pharmacists and American Nurses Association (2001). Code of ethics for nurses with interpretive statements at www.nursingworld.org/provision-3
13. Retchin, S. M., & Anapolle, J. (1993). An overview of the older driver. *Clinics in Geriatric Medicine*, 9(2), 279-296.
14. *Ferguson v. City of Charleston*, 532 U.S. 67, 121 S. Ct. 1281, 149 L. Ed. 2d 205 (2001). Remanded 308, F. 3d 380 (4th Cir. S.C. 2002). *Certiorari* Denied. 539 U.S. 928, 123 S. Ct. 2583, 156 L. Ed. 2d 605, 2003 U.S. LEXIS 4631, 71 U.S.L.W. 3744 (2003) (deliberating in a South Carolina case the benefits and risks of physician disclosing confidential patient information when that confidential information may protect patients and society from possible harm). Distinguished by *United States v. Zadeh*, 2015 U.S. Dist. LEXIS 11538 (N.D. Tex. Jan. 31, 2015) and *United States v. Katzin*, 732 F.3d 187, 2013 U.S. App. (3d Cir. Pa. 2013). *Conflicting Authority People v. Peppers*, 352 Ill. App. 1002, 817 N.E. 1152 (Ill. App. Ct. 1st Dist. 2004) at p 1006.
15. Justice, J. (1997). Patient confidentiality and pharmacy practice. *Consult Pharmacist*, 12(11). Available at: www.ascp.com/articles/quality-standards-and-practice-principles-senior-care-pharmacists See also: Erickson, J., & Millar, S. (2005, May 31). Caring for Patients While Respecting Their Privacy: Renewing Our Commitment. *The Online Journal of Issues in Nursing*. Vol. 10 No. 2, Manuscript 1. Available at: www.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/TablofContents/Volume102005/No2May05/tpc27_116017.html
16. Tasman, A., Kay, J., Lieberman, J. A., & Fletcher, J. (eds). (1997). Psychiatry, 1st ed. P. 1808. Philadelphia: W. B. Saunders Company. See also: Quality standards and practice principles for Senior care pharmacists quality standard three section 8 supra.
17. American Society of Consultant Pharmacists. (2011). Quality Standards and Practice Principles for Senior Care Pharmacists. Available at www.ascp.com/articles/quality-standards-and-practice-principles-senior-care-pharmacists See also: American Nurses Association. (2001). Code of ethics for nurses with interpretive statements. Available at www.nursingworld.org/provision-3

18. Shawn, C., Marshall, M., D., & Gilbert, N. (1999). Saskatchewan physicians' attitudes and knowledge regarding assessment of medical fitness to drive. *Canadian Medical Association Journal*, 160(12), 1701–1704.
19. Meuser, T. M., Carr, D. B., Ulfarsson, G. F., Berge-Weger, M., Niewoehner, P., Kim, J. K., ... Osberg, S. (2008). Medical Fitness to Drive and a Voluntary Reporting Law. Washington, DC: AAA Foundation for Traffic Safety. Available at www.aaafoundation.org/sites/default/files/MedicalFitnessToDriveReport.pdf
20. West, K., Bledsoe, L., Jenkins, J., & Nora, L. M. (2001). The Mandatory Reporting of Adult Victims of Violence: Perspectives from the Field. 90 Kentucky Law Journal, 1071 (2001-2002). See also: Kelly, R., Warke, T., & Steele, I. Medical restrictions to driving: the awareness of patients and doctors. *Postgraduate Medical Journal*, 75, 537–539.
21. Older Californian Traffic Safety Task Force, Health Services Workgroup and Policy and Legislation Workgroup, p.2. Retrieved from the Task Force website at <http://eldersafety.org/pdfs/MandatoryPhysicianReportingFactSheet-final.pdf> The six States are: California, Delaware, Nevada, New Jersey, Oregon, and Pennsylvania.
22. Lococo, K. (2003). Summary of Medical Advisory Board Practices in the United States. (Task Report Prepared Under NHTSA Contract No. DTNH22-02-P-05111). Quakertown, PA: TransAnalytics LLC. Available at <http://www.bioptricdriving.org/repository/main/-drvsummaryofmedicaladvisoryboardpractices.pdf> See also Meuser, T.M., Carr, D.B., Ulfarsson, G.F., Berge-Weger, M., Niewoehner, P., Kim, J.K., ...Osberg, S. (2008). Medical Fitness to Drive and a Voluntary Reporting Law. Washington, DC: AAA Foundation for Traffic Safety.
23. National Committee on Uniform Traffic Laws and Ordinances. (n.d.) Reporting of Driver Impairment Model Law (Web page). Retrieved from the committee's website at www.ncutlo.org/impairment.htm
24. Lococo, K., & Staplin, L. (2004). In-depth study to identify best practices for licensing drivers with medical and functional impairments and barriers to their implementation. (Published under Contract Task Order DTNH22-02-P-05111). Washington, DC: National Highway Traffic Safety Administration.
25. *Duvall v. Goldin*, supra at FN 9.
26. Carr, D. B. (2000). The older adult driver. *American Family Physician*, 61(1), 141–148.
27. National Highway Traffic Safety Administration. (n.d.) Driving Safely While Aging Gracefully. Washington, DC: Author. Available at www.nhtsa.gov/people/injury/olddrive/Driving%20Safely%20Aging%20Web/

28. National Highway Traffic Safety Administration. (n.d.) Drive Well Toolkit: Promoting Older Driver Safety and Mobility in Your Community (Web page/portal). Washington, DC: Author. Available at www.nhtsa.gov/Driving+Safety/Older+Drivers/Drive+Well+Toolkit:+Promoting+Older+Driver+Safety+and+Mobility+in+Your+Community
29. Kaplan, N., & White, M. (2007, May). Getting Around: Alternatives for Seniors Who No Longer Drive. Washington, DC: AAA Foundation for Traffic Safety. Available at www.aaafoundation.org/sites/default/files/GettingAroundReport.pdf
30. Sterns, H. L., Sterns, R., Aizenberg, R., & Anapole, R. (2001, August). Family and Friends Concerned About an Older Driver (Report No. DOT HS 809 307). Washington, DC: National Highway Traffic Safety Administration. Available at <http://ntl.bts.gov/lib/26000/26000/26070/DOT-HS-809-307.pdf>
31. American Medical Association. (2008). The American Medical Association Principles of Medical Ethics; Preamble, generally I-IX. Adopted June 1957, revised June 1980, revised June 2001. Code of Medical Ethics of the American Medical Association: Council on Ethical and Judicial Affairs; 2008–2009 Edition. Chicago: Author.
32. Messinger-Rapport, B., & Rader, E. (2000). High risk on the highway: how to identify and treat the impaired older driver. *Geriatrics*, 55(10), 32–45.
33. Capen, K. (1994). New court ruling on fitness-to-drive issues will likely carry “considerable weight” across country. *Canadian Medical Association Journal*, 151(5), 667.
34. Tripodis, V. L. (1997). Licensing policies for older drivers: balancing public safety with individual mobility. *Boston College Law Review*, 38 B.C.L. Rev 1051.

CHAPTER 8 STATE LICENSING AND REPORTING LAWS

Key Points

- Each State has its own licensing and license renewal criteria.
- Licensing and license renewal information is subject to change, and statutes for specific States should be checked for up-to-date changes in laws or requirements.

Each State has its own licensing and license renewal criteria for drivers of private motor vehicles. In addition, certain States require health care professionals to report unsafe drivers or drivers with specific medical conditions to the driver licensing agency. State law restrictions for older drivers vary according to age requirements of additional drivers, length of renewal cycle, vision requirements, license restrictions, level of mandatory reporting by health care professionals, civil immunity, anonymity protection, and process for evaluation by medical advisory boards. The effectiveness of driving restrictions in reducing vehicle crashes or fatalities involving older adults also varies from State to State.

Licensing agency contact information by State is listed below, along with additional resources for locating license renewal criteria, reporting procedures, and medical advisory board information. These materials are intended to guide health care professionals in understanding their legal responsibilities and managing the driving safety of their patients. The information provided should neither be construed as legal advice nor used to resolve legal problems. If legal advice is required, a licensed attorney (in the relevant State) should be consulted.

A database of driver licensing policies and practices for licensing requirements, license renewal procedures, reporting procedures, medical advisory board information, and more can be found at <http://lpp.seniordrivers.org/lpp/index.cfm?selection=visionregs>.

This information is subject to change, and statutes for specific States should be checked for up- to-date changes in laws or requirements. This is especially important when creating a clinic policy or deciding on an individualized approach to reporting. Legal counsel is recommended to advise on decision-making in this area.

If information is not available from a specific State's driver licensing agency, the following references, which are updated frequently, may be useful:

- Insurance Institute for Highway Safety (www.iihs.org/iihs/topics/laws/olderdrivers)
- Insurance Information Institute (www.iii.org/)

Testing procedures and regulations impose significant costs on States and, at times, inconvenience and costs to individual drivers. If licenses are revoked, older adults face the problems of restricted mobility and loss of out-of-home activities, which may decrease social connectedness. In addition, the impact on family members and caregivers, such as time away from work, is not insignificant. This burden must be carefully weighed against the actual “added value” or benefits of improved public safety.¹

State Licensing Agencies

Alabama

Alabama Law Enforcement Agency Department of Public Safety
PO Box 1471
Montgomery, AL 36102-1471
www.alea.gov
334-242-4400

Alaska

Alaska Department of Administration Division of Motor Vehicles
1300 W. Benson Boulevard
Anchorage, AK 99503-3696
www.state.ak.us/dmv/
907-269-5551

Arizona

Arizona Department of Transportation
Motor Vehicle Division
PO Box 2100, Mail Drop 555M
Phoenix, AZ 85001-2100
www.azdot.gov/mvd/
800-251-5866

Arkansas

Arkansas Department of Finance and Administration Arkansas Driver Control
1910 West W. 7th St., Rm 1070
Little Rock, AR 72201
www.state.ar.us/dfa/odd/motor_vehicle.html
501-682-1631

California

California Department of Motor Vehicles Licensing Operations Division
2570 24th Street, MS J152
Sacramento, CA 95818-2698
www.dmv.ca.gov/
916-657-6550

Colorado

Colorado Department of Revenue Division of Motor Vehicles
1881 Pierce Street, Room 136
Lakewood, CO 80214
www.colorado.gov/revenue/dmv
303-205-5600

Connecticut

Connecticut Department of Motor Vehicles
60 State Street
Wethersfield, CT 06161-2510
www.ct.gov/dmv/site/default.asp
860-263-5700

Delaware

Delaware Division of Motor Vehicles
Driver License Administration Medical Section
PO Box 698
Dover, DE 19903
www.dmv.de.gov
302-744-2507

District of Columbia

District of Columbia Department of Motor Vehicles Medical Review Office
301 C Street NW.
Washington, DC 20001
www.dmv.dc.gov/
202-737-4404

Florida

Florida Highway Safety and Motor Vehicles
Medical Review Office
www.flhsmv.gov/floridagrandidriver/reportUnsafeDriver.html
850-617-3814

Georgia

Georgia Department of Driver Services Attn: Medical Unit

PO Box 80447

Conyers, GA 30013

www.dds.ga.gov/drivers/index.aspx

678-413-8400 or outside Atlanta metro 866-754-3687

Hawaii

Honolulu Department of Customer Services Division of Motor Vehicles & Licensing 1199

Dillingham Boulevard, Bay A 101

Honolulu, HI 96817

www.honolulu.gov/csd/default.html

808-532-7730

Idaho

Idaho Transportation Department

Division of Motor Vehicles - Driver Services

PO Box 7129

Boise, ID 83707-1129

www.itd.idaho.gov/dmv/online_services.htm

208-334-8736

Illinois

Illinois Office of the Secretary of State

Driver Services Department

2701 S. Dirksen Parkway

Springfield, IL 62723

217-782-6212

Driver Services Department–Metro

17 N. State Street, Suite 1100

Chicago, IL 60602

312-793-1010

www.cyberdriveillinois.com/

Indiana

Indiana Bureau of Motor Vehicles

Indiana Government Center North 100 N Senate Avenue, Room 402

Indianapolis, IN 46204

www.in.gov/bmv/

888-692-6841

Iowa

Iowa Department of Transportation Motor Vehicles Division
PO Box 9204
Des Moines, IA 50306-9204
www.dot.state.ia.us/mvd/
515-237-3121 or 800-532-1121

Kansas

Kansas Department of Revenue
Division of Motor Vehicles, Driver Solutions
PO Box 12021
Topeka, KS 66612-2021
www.ksrevenue.org
785-296-3963

Kentucky

Kentucky Transportation Cabinet Division of Driver Licensing
200 Mero Street
Frankfort, KY 40622
<http://transportation.ky.gov/Driver-Licensing/Pages/default.aspx>
502-564-0280

Louisiana

Louisiana Office of Motor Vehicles Office of Motor Vehicles
PO Box 64886
Baton Rouge, LA 70896
www.expresslane.org
225-925-6146

Maine

Maine Bureau of Motor Vehicles Attn: Medical Advisory Board
29 State House Station
Augusta, ME 04333-0029
www.state.me.us/sos/bmv
209-624-9000 ext 52124

Maryland

Maryland Motor Vehicle Administration 6601 Ritchie Highway NE
Glen Burnie, MD 21062
www.mva.maryland.gov/
410-768-7000 or 800-492-4575

Massachusetts

Massachusetts Registry of Motor Vehicles Medical Affairs Branch
PO Box 199100
Boston, MA 02119-9100
www.mass.gov/portal/
857-368-8000 or 800-858-3926

Michigan

Michigan Department of State
Driver Assessment and License Appeal Unit
Lansing, MI 48918
www.michigan.gov/sos
888-767-6424

Minnesota

Minnesota Department of Public Safety Driver and Vehicle Services
Attn: Medical Unit
445 Minnesota Street, Suite 170
St Paul, MN 55101-5170
<http://dps.mn.gov/Pages/default.aspx>
651-296-2025

Mississippi

Mississippi Department of Public Safety Driver Improvement PO Box 958
Jackson, MS 39205
www.dps.state.ms.us
601-987-1515 or 601-987-1231

Missouri

Missouri Department of Revenue
301 West High Street, Room 470
Jefferson City, MO 65105-0200
www.dor.mo.gov/mvdl/drivers/
573-751-2730

Montana

Montana Department of Justice Motor Vehicles Division

PO Box 201430

Helena, MT 59620-1430

<https://dojmt.gov/driving/#contact>

406-444-4590

Nebraska

Nebraska Department of Motor Vehicles Driver Licensing Services

301 Centennial Mall South, PO Box 94726

Lincoln, NE 68509-4726

www.dmv.nebraska.gov/

402-471-3861

Nevada

Nevada Department of Motor Vehicles Management Services and Programs Division 555

Write Way

Carson City, NV 89711

www.dmvnv.com

775-684-4562

New Hampshire

New Hampshire Department of Safety Division of Motor Vehicles

10 Hazen Drive

Concord, NH 03305

www.nh.gov/safety

800-735-2964

New Jersey

New Jersey Division of Motor Vehicles Medical Fitness Review Unit

PO Box 173

Trenton, NJ 08666-0173

www.state.nj.us/mvc/Licenses/medical_review.htm

609-292-7500 ext 5032

New Mexico

New Mexico Motor Vehicles Division Drivers Services Bureau

PO Box 1028

Santa Fe, NM 87504-1028

www.mvd.newmexico.gov/

888-683-4636

New York

New York Department of Motor Vehicles Medical Review Unit
6 Empire State Plaza, Room 337
Albany, NY 12228
<http://dmv.ny.gov/driver-license/dmvs-medical-review-program>
518-474-0774

North Carolina

North Carolina Division of Motor Vehicles Driver License Medical Division
1100 New Bern Ave
Raleigh, NC 27697
www.ncdot.gov/DMV/
919-861-3809

North Dakota

North Dakota Department of Transportation Drivers License Division
Attn: Chief Examiner
608 East Boulevard Avenue
Bismarck, ND 58505-0750
www.dot.nd.gov/
701-328-4353

Ohio

Ohio Bureau of Motor Vehicles
Driver License Special Case Section/Medical Unit
PO Box 16784
Columbus, OH 43216-6784
www.bmv.ohio.gov
614-752-7500

Oklahoma

Oklahoma Department of Public Safety Driver Improvement Division
Attn: Medical Advisory Committee
PO Box 11415
Oklahoma City, OK 73136-0415
www.dps.state.ok.us/dls/
405-425-2059

Oregon

Oregon Department of Motor Vehicles Driver Safety Unit
1905 Lana Avenue NE
Salem, OR 97314-4120
www.oregon.gov/ODOT/DMV/Pages/index.aspx
503-945- 5083 or 503-945-5295

Pennsylvania

Pennsylvania Department of Transportation Bureau of Driver Licensing
Driver Qualifications Section
PO Box 68682
Harrisburg, PA 17106-8682
www.dmv.state.pa.us/centers/olderDriverCenter.shtml
717-787-9662

Rhode Island

Rhode Island Department of Revenue Division of Motor Vehicles
Medical Review Board
600 New London Ave
Cranston, RI 02920
www.dmv.ri.gov/
401-462-0800

South Carolina

South Carolina Department of Motor Vehicles
PO Box 1498
Blythewood, SC 29016
www.scdmvonline.org/DMVNew/
803-896-5000

South Dakota

South Dakota Department of Public Safety Driver Licensing
118 West Capitol Avenue
Pierre, SD 57501
<http://dps.sd.gov/>
800-952-3696 or 605-773-6883

Tennessee

Tennessee Department of Safety & Homeland Security Driver License Division
1150 Foster Ave
Nashville, TN 37249-1000
<http://state.tn.us/safety/driverservices.shtml>
615-741-3954

Texas

Texas Department of Public Safety Driver License Division
Enforcement and Compliance Service
PO Box 4087
Austin, TX 78773-0320
www.txdps.state.tx.us
512-424-2600

Utah

Utah Department of Public Safety Driver License Division
PO Box 144501
Salt Lake City, UT 84129
www.driverlicense.utah.gov
801-965-4437

Vermont

Vermont Department of Motor Vehicles
120 State Street
Montpelier, VT 05603-0001
<http://dmv.vermont.gov/>
802-828-2000 or 802-828-2011

Virginia

Virginia Department of Motor Vehicles Medical Review Services
PO Box 27412
Richmond, VA 23269-0001
www.dmv.state.va.us/
804-497-7100

Washington

Washington State Department of Licensing Driver Records

PO Box 9030

Olympia, WA 98507-9030

www.dol.wa.gov/

360-902-3900

West Virginia

West Virginia Department of Transportation Division of Motor Vehicles

Medical Review Services

PO Box 17030

Charleston, WV 25317

www.transportation.wv.gov/dmv/Pages/default.aspx

800-642-9066 or 304-926-3961

Wisconsin

Wisconsin Department of Transportation Medical Review

PO Box 7918

Madison, WI 53707-7918

www.dot.wisconsin.gov/drivers/index.htm

608-266-2327

Wyoming

Wyoming Department of Transportation Driver Services Program

5300 Bishop Blvd.

Cheyenne, WY 82009-3340

<http://dot.state.wy.us>

307-777-4800

Additional Resources

AAA/CAA Digest of Motor Laws

<http://drivinglaws.aaa.com/>

Driver Licensing Policies and Practices

<http://lpp.seniordrivers.org/lpp/index.cfm?selection=visionregs>

Insurance Institute for Highway Safety

www.iihs.org/laws/olderdrivers.aspx

Insurance Information Institute

www.iii.org

Reference

1. Miller, T. R., & Levey, D. T. (2000). Cost-outcome analysis in injury prevention and control: Eighty-four recent estimates for the United States. *Medical Care*, 28(6), 562–582.

CHAPTER 9 MEDICAL CONDITIONS, FUNCTIONAL DEFICITS, AND MEDICATIONS THAT MAY AFFECT DRIVING SAFETY

Key Points

- Many medical conditions, functional deficits, and/or medications may potentially impair driving.
- Treat the underlying medical condition and/or functional deficit to improve the condition/impairment or limit progression.
- If the functional deficit is due to an identifiable offending agent (e.g., medication with potentially driver-impairing [PDI] effects), remove the offending agent or reduce the dose, if possible.
- Advise the older adult about the risks to his or her driving safety, consider referral for assessment of driving performance, recommend driving restrictions or driving cessation as needed, and document the discussion in the health record.

This chapter contains reference tables of medical conditions, functional deficits, and medications that may impair driving skills, with associated consensus recommendations. Whenever scientific evidence supports the recommendations, it is included. These recommendations apply only to drivers of private motor vehicles and should not be applied to commercial drivers. Although many of the listed medical conditions are more prevalent in the older population, the recommendations apply to all drivers with medical impairments, regardless of age.

The medical conditions were chosen for their relevance to clinical practice and/or because there is some evidence-based literature indicating an association with driving impairment. Interested clinicians are referred to reviews that provide details regarding individual conditions or deficits, as well as guidelines from other countries, including Australia, Canada, Ireland, and the United Kingdom.¹⁻⁸

Although these recommendations are based on scientific evidence whenever possible, their use per se has not yet been proved to reduce crash risk.* However, increasing evidence suggests that interventions for some medical conditions (e.g., treating obstructive sleep apnea, performing cataract surgery, discontinuing a benzodiazepine) and functional deficits (e.g., improving information processing speed, physical ability), combined with classroom and on-road training may lower crash risk or enhance/maintain driving performance. As such, these recommendations are provided as a means to help raise awareness of which drivers might be at increased risk, suggest options for intervention, and guide the decision-making process. When evidence is not available, the recommendations are based on consensus recommendations and best clinical judgment. They are not intended to substitute for the individual clinician's judgment.

**Note:* Although scientific evidence links certain medical conditions and levels of functional impairment with crash

risk, more research is needed to establish that driving restrictions based on these medical conditions and levels of functional impairment significantly reduce crash risk.

How to Use This Chapter

Clinicians may consult this chapter for questions on specific medical conditions, functional deficits (e.g., deficits in vision, cognition, or motor function), and/or medications that may have an effect on driving safety. If an older adult presents with any of these issues, clinicians may base further assessment and interventions for driving safety on the guidelines presented here.

General Recommendations

- Treat the underlying medical condition and/or functional deficit to improve the condition/impairment or limit progression.
- If the functional deficit is due to an identifiable offending agent (e.g., medication with PDI effects), remove the offending agent or reduce the dose, if possible.
- If the functional deficit can be addressed through compensation or modification (e.g., hand controls, left foot accelerator), refer for a comprehensive driving evaluation.
- Advise the older adult about the risks to his or her driving safety, consider referral for assessment of driving performance, recommend driving restrictions or driving cessation as needed, and document the discussion in the health record.
- For acute or episodic illnesses (e.g., seizure disorder and/or diabetes with hypoglycemia), clinical judgment and subspecialist input is recommended, in addition to following specific State statutes.

If further evaluation is required and desirable, or the conditions and/or functional deficits are not medically correctable, the older adult should be referred to a driver rehabilitation specialist (DRS) for a driving evaluation (including on-road assessment). The DRS may prescribe adaptive equipment and training on how to use it (see Chapter 5).

Clinicians should advise older adults against driving if they report symptoms that are irreversible, for which no safe compensatory techniques/equipment are available, and are incompatible with safe driving (e.g., visual changes, syncope or presyncope, vertigo, etc.). If these symptoms continue despite extensive medical evaluation and treatment, such individuals should be strongly urged to seek alternative forms of transportation, including taxis, rides from family and friends, and medical transportation services.

In the hospital and the emergency department, driving should be routinely addressed before the older adult's discharge whenever appropriate, especially in the presence of new functional deficits or when prescribing new medications. Even for the older adult whose symptoms or treatment clearly precludes driving, it should not be assumed that the person is aware that he or she should not drive. The clinician should counsel the older adult regarding driving and

discuss a future plan (e.g., resumption of driving on resolution of symptoms, driver rehabilitation on stabilization of symptoms, reassessment by the primary clinician or relevant specialist before driving resumption) and document the discussion in the health record.

An older adult's driving purposes may range from being responsible for taking grandchildren to day care to driving for a vocation (e.g., a salesperson who drives throughout a region). Such differences may influence the extent of the interventions or advice in regard to an evaluation. For example, more restriction or a performance-based road test may be more aggressively pursued for an older adult who frequently drives long distances over unfamiliar roads versus for one who drives short, familiar routes.

Reference Tables of Medical Conditions, Functional Deficits, and Medications That May Affect Driving Safety

Various medical conditions and/or functional deficits are covered in the following sections (with corresponding tables). Conditions treated with medications with PDI effects are listed at the end of the discussion for that condition and cross-referenced to Section 13 (on medications) for more information.

Section 1: Vision and Hearing Loss

Section 2: Cardiovascular Disorders

Section 3: Cerebrovascular Disorders

Section 4: Neurologic Disorders

Section 5: Psychiatric Disorders

Section 6: Metabolic Disorders

Section 7: Musculoskeletal Disorders

Section 8: Peripheral Vascular Disorders

Section 9: Renal Disorders

Section 10: Respiratory and Sleep Disorders

Section 11: Effects of Anesthesia and Surgery

Section 12: Cancer

Section 13: Medications

Section 1: Vision and Hearing Loss

Vision is the primary sense used in driving (versus hearing and proprioception) and is responsible for 95% of driving-related sensory inputs.⁹ Age- and disease-related changes of the eye and brain may affect visual acuity, visual fields, night vision, contrast sensitivity, and other aspects of vision. External obstruction of view (e.g., blepharoptosis) should not be overlooked, because it may significantly limit visual fields. The literature on eye disease suggests that driving impairment is likely mediated by impairment in contrast sensitivity,¹⁰ visual fields,¹¹ or visual processing speed.

Whenever possible, vision deficits should be managed and corrected. Interventions for common eye diseases such as age-related macular degeneration,¹² glaucoma,¹³ and cataracts¹⁴ have the potential to improve or stabilize the condition, and in some cases these interventions have been noted to reduce crash risk.¹⁵ Older adults with persistent vision deficits may potentially reduce their effect on driving safety by restricting travel to low-risk areas and conditions, such as familiar surroundings, low-speed areas, non-rush hour traffic, daytime, and good weather conditions. This has been noted for certain eye diseases, such as glaucoma.¹⁶ It should also be noted that bioptic driving is now allowed in 37 States.¹⁷ Bioptic driving is a method of driving in which a small telescopic system is used to improve a person's far vision for some visually impaired individuals and might be considered for some drivers. The recommendations below are subject to each State's licensing requirements. For resources to locate Internet listings for current individual State laws, see Chapter 8.

Sensory Deprivation

1. Visual acuity
 - a. Cataracts
 - b. Retinopathy (diabetic or hypertensive)
 - c. Keratoconus
 - d. Macular degeneration
 - e. Nystagmus
 - f. Telescopic lens
2. Visual field
 - a. Glaucoma
 - b. Hemianopia/quadrantanopia
 - c. Monocular vision
 - d. Ptosis or upper lid redundancy
 - e. Retinitis pigmentosa
3. Contrast sensitivity
4. Defective color vision
5. Poor night vision and glare recovery
6. Diplopia
7. Hearing loss

Table 9.1 Sensory Deprivation

Visual acuity

Many States require far visual acuity of 20/40 for licensure. State driver licensing agencies are urged to base their visual acuity requirements on the most current data, as appropriate. Referral to an ophthalmologist is recommended to optimize refraction and because common causes for visual impairment (cataracts, macular degeneration, glaucoma) can improve and/or stabilize with treatment.

Visual acuity may be measured with both eyes open or with the best eye open, as the individual prefers. The older adult should wear any corrective lenses usually worn for driving.

Older adults with decreased far visual acuity may potentially lessen its effect on driving safety by restricting driving to low-risk areas and conditions (e.g., familiar surroundings, non-rush hour traffic, low-speed areas, daytime, and good weather conditions).

For best-corrected far visual acuity less than 20/70, clinicians should recommend an on-road assessment performed by a DRS (where permitted and available) to evaluate the older adult's performance in the actual driving task.

For best-corrected far visual acuity less than 20/100, clinicians should recommend the older adult not drive unless safe driving ability can be demonstrated in an on-road assessment performed by a DRS (where permitted and available). See also Telescopic lens, below.

Cataracts

No restrictions if standards for visual acuity and visual fields are met, either with or without cataract removal.

Individuals who require increased illumination or who experience difficulty with glare recovery should avoid driving at night and under low-light conditions, such as during adverse weather.

Diabetic or hypertensive retinopathy

No restrictions if standards for visual acuity and visual fields are met.

Annual eye examinations are recommended for diabetic individuals.

<i>Keratoconus</i>	<p>Individuals with severe keratoconus correctable with hard contact lenses should drive only when the lenses are in place. If lenses cannot be tolerated, individuals with severe keratoconus should not drive even if they meet standards for visual acuity, because their acuity dramatically declines outside their foveal vision, rendering their peripheral vision useless.</p>
<i>Macular degeneration</i>	<p>No restrictions if standards for visual acuity and visual fields are met.</p> <p>Older adults who experience difficulty with glare recovery should avoid driving at night. Individuals with the neovascular “wet” form may require frequent assessment because of the rapid progression of the disease.</p>
<i>Nystagmus</i>	<p>No restrictions if standards for visual acuity and visual fields are met.</p>
<i>Telescopic lens</i>	<p>A bioptic telescope is an optical telescope mounted on the lens of eyeglasses. During normal use, the wearer can view the environment through the regular lens.</p> <p>When extra magnification is needed, a slight downward tilt of the head brings the object of interest into the view of the telescope.¹⁸ The specialist who prescribes a telescopic lens should ensure that the older adult is properly trained in its use.</p> <p>It has not been established whether telescopes enhance the safety of low-vision drivers. The American Academy of Ophthalmology’s Policy Statement, Vision Requirements for Driving (approved by Board of Trustees, October 2001) states:</p> <p>“More than half the States allow drivers to use bioptic telescopes mounted on glasses, through which they spot traffic lights and highway signs. It has not yet been demonstrated whether the estimated 2,500 bioptic drivers in the United States drive more safely with their telescopes than they would without them. The ability to drive safely using bioptic telescopes should be demonstrated in a road test in all cases.”</p> <p>A road test should be administered only in those States that permit the use of bioptic telescopes in driving.</p>

Visual field

Although an adequate visual field is acknowledged to be important for safe driving, there is no conclusive evidence to define what is meant by “adequate” nor is there any consistent standard as to how visual fields are tested. Visual field requirements vary between States, with many States requiring a visual field of 100 degrees or more along the horizontal plane, and other States having a lesser requirement or none at all.¹⁸

If the primary care clinician has any reason to suspect a visual field defect (e.g., through personal report, medical history, or confrontation testing), he or she should refer the older adult to an ophthalmologist or optometrist for further evaluation. Both the primary care clinician and specialist should be aware of and adhere to their State’s visual field requirements, if any.

For binocular visual field at or near the State minimum requirement or of questionable adequacy (as deemed by clinical judgment), a comprehensive driving evaluation (including on-road assessment) performed by a DRS is strongly recommended.

Through driving rehabilitation, older adults may learn how to compensate for decreased visual fields, although not hemineglect. In addition, the DRS may prescribe enlarged side and rear view mirrors as needed and train the older adult in their use.

Glaucoma

No restrictions if standards for visual acuity and visual fields are met. Continued follow-up with an ophthalmologist and monitoring of visual fields and intraocular pressure are recommended.

Hemianopia/ quadrantanopia

Clinicians may choose to refer older adults to a DRS for assessment and rehabilitation. With or without rehabilitation, older adults should drive only if they demonstrate safe driving ability in an on-road assessment performed by a DRS.

Monocular vision

Older adults with acquired monocular vision may need time to adjust to the lack of depth perception and reduction in total visual field. This period of adjustment varies among individuals, but it is reasonable to recommend temporary driving cessation for several weeks.

After this period, there are no restrictions if standards for visual acuity and visual fields are met. After individuals start driving again, they should be advised to assess their comfort level by driving in familiar, traffic-free areas before advancing to areas of heavy traffic. Again, use of larger mirrors and evaluation and training by a DRS are encouraged.

Ptosis or lid redundancy, blepharospasm

Individuals with fixed ptosis or lid redundancy may drive without restrictions if their eyelids do not obscure the visual axis of either eye and they are able to meet standards for visual acuity and visual fields without holding their head in an extreme position. Blepharospasms should be controlled so there is no interference with vision.

Retinitis pigmentosa

No restrictions if standards for visual acuity and visual fields are met.

Older adults who require increased illumination or who experience difficulty adapting to changes in light should not drive at night or under low-light conditions, such as during storms.

Contrast sensitivity

Contrast sensitivity is a measure of an individual's ability to perceive visual stimuli that differ in contrast and spatial frequency. Contrast sensitivity tends to decline with age; accordingly, deficits in contrast sensitivity are much greater in older adults than in their younger counterparts.² Among older drivers, binocular measures of contrast sensitivity have been found to be a valid predictor of crash risk in individuals with cataracts.¹⁹ However, there are presently no standardized cut-off points for contrast sensitivity and safe driving, and it is not routinely measured in eye examinations. Older adults can be educated about driving conditions to avoid if they have poor contrast sensitivity (e.g., dawn, dusk, fog).

Defective color vision

No restrictions if standards for visual acuity and visual fields are met.

Deficits in color vision are common (especially in men) and usually mild.

There appears to be no correlation between defective color vision and crash rates.²⁰ Some States require prospective drivers to undergo color vision screening, and many of these States require screening for commercial drivers only.¹⁸

Despite reported difficulties with color vision discrimination while driving (difficulty distinguishing color of traffic signals, confusing traffic lights with street lights, and difficulty detecting brake lights), it is unlikely that color vision impairments represent a significant driving hazard.² Standardization of traffic signal positions allows color blind individuals to interpret traffic signals correctly based on position. Clinicians may wish to advise older adults that the order of signals in the less commonly used horizontal placement of left to right is red, yellow, green.

Poor night vision

If the older adult reports poor visibility at night, clinicians should recommend ophthalmologic and/or optometric evaluation. If the evaluation does not reveal a treatable cause for poor night vision, clinicians should recommend that the older adult not drive at night or under other low-light conditions, such as during storms or at dusk.

Diplopia

Individuals with double vision in the central aspect of vision (20 degrees above and below, left and right of fixation) should not drive. Those with uncorrected diplopia should be referred to an ophthalmologist or optometrist for further assessment to determine if the defect can be corrected with prisms or a patch and meet standards for driving. There should be a 3-month adjustment period, after which specialists can determine if adequate adjustment has occurred.⁶

Hearing loss

No restrictions.

Relatively few studies have examined the relationship between hearing impairment and risk of motor vehicle crash. Of these, none have shown a significant relationship between hearing impairment and risk of crash.² However, a recent study suggested that a combination of hearing and vision deficits might increase crash risk.²¹

Section 2: Cardiovascular Disorders

1. Unstable coronary syndrome (unstable angina or myocardial infarction)
2. Cardiac rhythm abnormalities that may cause a sudden, unpredictable loss of consciousness
 - a. Atrial flutter/fibrillation with bradycardia or rapid ventricular response
 - b. Paroxysmal supraventricular tachycardia, including Wolf-Parkinson-White syndrome
 - c. Prolonged, nonsustained ventricular tachycardia
 - d. Sustained ventricular tachycardia
 - e. Cardiac arrest
 - f. High-grade atrioventricular block
 - g. Sick sinus syndrome/sinus bradycardia/sinus exit block/sinus arrest
3. Cardiac disease resulting from structural or functional abnormalities
 - a. Congestive heart failure with low output syndrome
 - b. Hypertrophic obstructive cardiomyopathy
 - c. Valvular disease (especially aortic stenosis)
4. Time-limited restrictions: cardiac procedures
 - a. Percutaneous transluminal coronary angioplasty
 - b. Pacemaker insertion or revision
 - c. Cardiac surgery involving median sternotomy
 - d. Coronary artery bypass graft
 - e. Valve repair or replacement
 - f. Heart transplant
5. Internal cardioverter defibrillator (ICD)

Although the data are still unclear in regard to a definitive relationship between crash risk and cardiovascular diseases, one study noted a modest increase in total crash risk and at-fault risk for older adults with cardiac disease.²² For older adults with known cardiac disease, clinicians should strongly and repeatedly caution such individuals to seek help immediately on experiencing any symptoms that may indicate an unstable cardiac situation, including prolonged chest discomfort, acute shortness of breath, syncope, presyncope, palpitations, lightheadedness, etc. Under no circumstances should the older adult drive while experiencing these symptoms, even to seek help.

Table 9.2 Cardiovascular Disorders

**Unstable coronary syndrome
(unstable angina or myocardial
infarction)**

Older adults should not drive if they experience symptoms at rest or at the wheel.

Individuals may resume driving when they have been stable and asymptomatic for 1–4 weeks, as determined by a cardiologist, after treatment of the underlying coronary disease. Driving may usually resume within 1 week after successful revascularization by percutaneous transluminal coronary angioplasty and by 4 weeks after coronary artery bypass grafting (CABG).²³

See also recommendations for CABG below (4.c in this section).

**Cardiac conditions that may
cause a sudden, unpredictable
loss of consciousness**

A main consideration in determining medical fitness to drive for older adults with cardiac conditions is the risk of presyncope or syncope due to a slow or rapid rhythm abnormality.²⁴ For older adults with a known arrhythmia, clinicians should identify and treat the underlying cause of arrhythmia, if possible, and recommend temporary driving cessation until symptoms have been controlled.

*Atrial flutter/fibrillation with
bradycardia or rapid ventricular
response*

No further restrictions once heart rate and symptoms have been controlled.

*Paroxysmal supraventricular
tachycardia, including Wolf-
Parkinson-White syndrome*

No restrictions if the older adult is asymptomatic during documented episodes.

Older adults with a history of symptomatic tachycardia may resume driving after they have been asymptomatic for 6 months on antiarrhythmic therapy.

Individuals who undergo radiofrequency ablation may resume driving after 6 months if there is no recurrence of symptoms, or sooner if no preexcitation or arrhythmias are induced on repeat electrophysiologic testing.

*Prolonged, nonsustained
during ventricular tachycardia
(VT)*

No restrictions if the older adult is asymptomatic documented episodes.

Individuals with symptomatic VT may resume driving after 3 months if they are on antiarrhythmic therapy (with or without an ICD) guided by invasive electrophysiologic testing, and VT is noninducible at repeat electrophysiologic testing. They may resume driving after 6 months without arrhythmia events if they are on empiric antiarrhythmic therapy (with or without an ICD), or have an ICD alone without additional antiarrhythmic therapy.²⁵

*Sustained ventricular
tachycardia (VT)*

Older adults may resume driving after 3 months if they are on antiarrhythmic therapy (with or without an ICD) guided by invasive electrophysiologic testing, and VT is noninducible at repeat electrophysiologic testing.

Individuals may resume driving after 6 months without arrhythmia events if they are on empiric antiarrhythmic therapy (with or without an ICD), or have an ICD alone without additional antiarrhythmic therapy.²⁵

Long-distance and/or sustained high-speed driving is not recommended. Older adults with VT should avoid the use of cruise control.²⁵

Post-cardiac arrest

See the recommendations for sustained VT (above).

For individuals who experience a seizure in the setting of cardiac arrest, see the recommendations for seizure disorder in Section 4, Neurologic Diseases.

If clinically significant cognitive changes persist after the older adult's physical recovery, cognitive testing is recommended before the older adult is permitted to resume driving. In addition, on-road testing performed by a DRS may be useful in assessing an older adult's fitness to drive.

*High-grade
atrioventricular block*

For symptomatic block managed with pacemaker implantation, see pacemaker recommendations in this section.

For symptomatic block corrected without a pacemaker (e.g., by withdrawal of medications that caused the block), older adults may resume driving after they have been asymptomatic for 4 weeks and ECG documentation shows resolution of the block.

*Sick sinus syndrome/sinus
bradycardia/sinus exit
block/sinus arrest*

No restrictions if the older adult is asymptomatic. Regular medical follow-up is recommended to monitor progression.

For symptomatic disease managed with pacemaker implantation, see pacemaker recommendations in this section.

Clinicians should be alert to possible cognitive deficits due to chronic cerebral ischemia. Clinicians may refer individuals with clinically significant cognitive changes to a DRS for an evaluation of driver safety, including on-road assessment.

**Cardiac disease resulting from
structural or functional
abnormalities**

A main consideration in determining medical fitness to drive for older adults with abnormalities of cardiac structure or function is the risk of presyncope or syncope due to low cardiac output, and of cognitive deficits due to chronic cerebral ischemia.

Older adults who experience presyncope, syncope, extreme fatigue, or dyspnea at rest or at the wheel should cease driving.

Cognitive testing is recommended for those individuals with a history of cognitive impairment that may impair the older adult's driving ability. Clinicians may refer individuals with clinically apparent cognitive changes to a DRS for a comprehensive driving evaluation.¹

Congestive heart failure with low output syndrome

Older adults should not drive if they experience symptoms at rest or while operating a motor vehicle.

Clinicians should reassess older adults for driving fitness every 6 months to 2 years as needed, depending on clinical course and control of symptoms. Individuals with functional class III congestive heart failure (marked limitation of activity but no symptoms at rest, working capacity 2 to 4 metabolic equivalents (METs)) should be reassessed at least every 6 months.

Hypertrophic obstructive cardiomyopathy

Older adults who experience syncope or presyncope should not drive until they have been successfully treated.

Valvular disease (especially aortic stenosis)

Older adults who experience syncope or presyncope or unstable angina should not drive until the underlying disease is corrected.

**Time-limited restrictions:
cardiac procedures**

Driving restrictions for the following cardiac procedures are based on the older adult's recovery from both the procedure itself and the underlying disease for which the procedure was performed.

Percutaneous transluminal coronary angioplasty (PTCA)

Older adults may resume driving 48 hours to 1 week after successful PTCA and/or stenting procedures, depending on their baseline condition and course of recovery from the procedure and underlying coronary disease.^{25,26}

Pacemaker insertion or revision

Older adults may resume driving 1 week after pacemaker implantation if no longer experiencing presyncope or syncope:

- a. ECG shows normal sensing and capture, and
- b. Pacemaker performs within manufacturer's specifications.²⁶

*Cardiac surgery involving
median sternotomy*

Driving may usually resume 4 weeks after coronary artery bypass grafting (CABG) and/or valve replacement surgery, and within 8 weeks after heart transplant, depending on resolution of cardiac symptoms and the individual's course of recovery. In the absence of complications during or after surgery, the main limitation to driving is the risk of sternal disruption after median sternotomy.

If cognitive changes persist after the older adult's physical recovery, cognitive testing is recommended before the individual is permitted to resume driving. In addition, on-road testing performed by a DRS may be useful in assessing the older adult's fitness to drive.

**Internal cardioverter
defibrillator (ICD)**

See the recommendations for nonsustained and sustained ventricular tachycardia (2.c and 2.d in this section). If the device is used for primary, rather than secondary, prevention, driving may resume in 1 week if the older adult is subsequently asymptomatic.²⁷

Section 3: Cerebrovascular Disorders

1. Post intracranial surgery
2. Stroke
3. Transient ischemic attacks
4. Subarachnoid hemorrhage
5. Vascular malformation
6. Syncope

Strokes and other insults to the cerebrovascular system may cause a wide variety of symptoms, including sensory deficits (e.g., numbness or loss of sensation), motor deficits (e.g., weakness), and cognitive impairment (e.g., memory, hemispatial inattention). These symptoms range from mild to severe and may resolve almost immediately or persist for years. Because each person is affected uniquely, the clinician must take into account the individual older adult's constellation of symptoms, severity of symptoms, course of recovery, and baseline function when making recommendations concerning driving. Studies have indicated that a substantial number of community-dwelling stroke patients continue to drive a car.²⁸ However, most stroke patients may not receive any type of formal driving evaluation, but simply resume driving.²⁹ If present, the larger a homonymous visual field defect, the greater the likelihood of losing one's license. Unfortunately, many individuals may not be aware of this deficit.³⁰

Driving should always be discussed before the older adult's discharge from the hospital or rehabilitation center and the discussion documented in the health record.

Older adults with residual neurologic deficits who wish to resume driving should be referred to a DRS whenever possible. Although the time frame for this evaluation depends on the severity and extent of the deficits, many evaluations for cognitive and motor defects are performed between 3 and 6 months. Once symptoms have stabilized, the DRS should assess the older adult for fitness-to-drive through a comprehensive driving evaluation that includes clinical and on-road components. After assessment, the DRS may recommend compensatory techniques and/or adaptive devices (e.g., wide rear view mirror, spinner knob for steering wheel, left foot accelerator) and provide training in their use. Even individuals with mild deficits should undergo driver evaluation before resuming driving, if possible. Research indicates that a post-stroke determination of driving safety made on a medical basis alone may be inadequate.³¹ Several studies note associations with impairment on road tests with measures of perception, visual selective attention, mental speed, working memory, executive function, and complex visual-perception/attention information.³²⁻³⁴

For older adults whose symptoms clearly preclude driving, it should not be assumed that the individual is aware that he or she should not drive. In such cases, the clinician should counsel the older adult on driving cessation and document the discussion in the health record. Recovery from stroke may take up to a year and even though the older adult may not be able to drive within the first 3–6 months, it is possible that he or she may improve after a year to have the potential to drive.³⁵⁻³⁷

Table 9.3 Cerebrovascular Disorders

Post intracranial surgery

Older adults should not drive until symptoms of the disease and/or surgery have stabilized or resolved. See also stroke recommendations below (Section 3.2).

Stroke

Older adults with acute, severe motor, sensory, or cognitive deficits should not drive. Depending on the severity of residual symptoms and the degree of recovery, this restriction may be permanent or temporary.

On the individual's discharge from the hospital or rehabilitation center, clinicians may recommend temporary driving cessation until further neurologic recovery has occurred. Once neurologic symptoms have stabilized, clinicians should refer appropriate individuals with residual sensory loss, cognitive impairment, visual field defects, and/or motor deficits to a DRS for driver assessment and rehabilitation. The DRS may prescribe vehicle adaptive devices and train the older adult in their use.

Older adults with neglect or inattention should be counseled not to drive until symptoms have resolved and/or safe driving ability has been demonstrated through assessment by a DRS.

All individuals with moderate to severe residual hemiparesis should undergo driver assessment before resumption of driving. Even if symptoms improve to the extent that they are mild or completely resolved, older adults should still undergo a comprehensive driving evaluation, if available, because reaction time may continue to be affected and other comorbid conditions could further increase risk.

Individuals with aphasia who demonstrate safe driving ability may fail in their efforts to renew their license because of difficulties with the written examination. In these cases, the clinician should urge the licensing authority to make reasonable accommodations for the older adult's language deficit. A DRS may be able to determine whether the deficit is expressive in nature and thus may allow for interpretation of written (e.g., traffic signs) stimuli. However, traffic signs may still be interpreted based on color, shape, and symbol recognition.

Older adults with residual cognitive deficits should be assessed and treated as described in section 4 on Dementia. Periodic reevaluation of these individuals is recommended, because some may recover sufficiently over time or with appropriate intervention to permit safe driving.

Transient ischemic attacks (TIA) Older adults who have experienced a single TIA or recurrent TIAs should not drive until they have undergone medical assessment and appropriate treatment.

Subarachnoid hemorrhage Older adults should not drive until symptoms have stabilized or resolved. Driving may resume after medical assessment and, if deemed necessary by the clinician, driver evaluation, including on-road assessment, performed by a DRS.

Vascular malformation If a brain aneurysm or arteriovenous malformation is detected, the older adult should not drive until he or she has been assessed by a neurosurgeon. The individual may resume driving if the risk of a bleed is small, an embolization procedure has been successfully completed, and/or the individual is free of other medical contraindications to driving (e.g., uncontrolled seizures or significant perceptual or cognitive impairments).

Syncope Although the cause of syncope is often not identified, neurocardiogenic (or reflex mediated), orthostatic, and cardiac arrhythmia are among the most common etiologies when a cause can be found.^{38,39} In a case-control study of patients evaluated for syncope, neurally mediated and cardiac arrhythmia were the most common etiologies when a cause could be identified. Long-term survival and likelihood of recurrence were similar for those who had syncope while driving versus those who did not.⁴⁰

See Section 2 for causes of cardiac syncope.

Driving restrictions for neurally mediated syncope should be based on the severity of the presenting event and the anticipated likelihood of recurrence. No driving restrictions are necessary for individuals with infrequent syncope that occurs with warning and with clear precipitating causes. Older adults with severe syncope may resume driving after adequate control of the arrhythmia has been documented

and/or pacemaker follow-up criteria have been met (see 4 in Section 2).⁴¹ For individuals who continue to experience unpredictable symptoms after treatment with medications and pacemaker insertion, driving cessation is recommended.

Section 4: Neurologic Disorders

1. Brain tumor
2. Closed head injury
3. Dementia
4. Migraine and other recurrent headache syndromes
5. Movement disorders
6. Multiple sclerosis
7. Paraplegia and quadriplegia
8. Parkinson disease
9. Peripheral neuropathy
10. Seizure disorder
 - a. Single unprovoked seizure
 - b. Withdrawal or change of anticonvulsant drug therapy
11. Sleep disorders
 - a. Narcolepsy
 - b. Sleep apnea
12. Stroke
13. Tourette syndrome
14. Vertigo

Dementia deserves special emphasis, because it presents a significant challenge to driving safety. As the disease progresses, individuals will ultimately lose the ability to drive safely. In addition, older adults with dementia often lack insight into their deficits and, therefore, may be more likely than drivers with visual or motor deficits (who tend to self-restrict their driving to accommodate their declining abilities) to drive even when it is unsafe. In this case, it becomes the responsibility of family members and other caregivers to protect the safety of older adult drivers with dementia by enforcing driving cessation when this becomes necessary.

Several reviews on this topic may be of interest to clinicians.⁴²⁻⁴⁵ Fitness-to-drive studies in older adults with dementia indicate that 90% may be able to pass a road test in the very mild stages of the disease (clinical dementia rating of 0.5), whereas 40% may fail at a mild level of cognitive impairment (clinical dementia rating of 1.0).⁴⁶ Furthermore, most older adults with Alzheimer disease will eventually fail subsequent road tests when followed longitudinally, indicating that repeat testing at 6–12 months should be strongly considered.⁴⁷ However, there is uncertainty about prospective risk, at least in the near term. In one longitudinal study, some

mildly demented drivers not only passed a performance-based road test but also had an acceptable crash risk prospectively.⁴⁸ Although in-office evaluation may not replace an on-road assessment,⁴⁹ classification rates may improve as evidence mounts for measures of relevant cognitive and other abilities.⁵⁰⁻⁵¹ In addition, a dementia and driving curriculum modeled after an earlier version of this guide has been shown to improve knowledge, attitudes, confidence, and behaviors for health professionals who deal with older adults with dementia.⁵²

Although it is optimal to initiate discussions of driving safety with older adults and caregivers before driving becomes unsafe, dementia may be undetected and undiagnosed until late in the course of the disease. Initially, caregivers and clinicians may assume that the older adult's decline in cognitive function is a part of the "normal" aging process. Clinicians may also hesitate to screen for and diagnose dementia, because they feel that it is futile and that nothing can be done to improve the older adult's situation or slow disease progression. In addition, clinicians may be concerned about the amount of time required to effectively diagnose dementia and educate older adults and caregivers.⁵³ However, some individuals are able to achieve cognitive stability, at least for a time, with cholinesterase inhibitors or N-methyl-D-aspartate (NMDA) receptor antagonists. In addition, older adults are now being diagnosed on the "cusp" of the disease in the very early stages. A diagnosis of dementia by itself should not preclude driving but should prompt a discussion about meeting transportation needs and eventual driving cessation.

Clinician reluctance to screen for dementia is unfortunate, because early diagnosis is the first step in promoting the driving safety of these individuals and allowing them to maintain out-of-home mobility regardless of driving status. The second step is intervention, which includes medications to slow or stabilize the course of the disease, counseling to prepare the older adult and caregivers for eventual driving cessation, and serial assessment of the individual's driving abilities. When assessment shows that driving may pose a substantial safety risk to the older adult, driving cessation is a necessary third step, along with consideration of other transportation options that allow the individual to maintain out-of-home mobility. With early planning, older adults and their caregivers can make a more seamless transition from driving to non-driving status.

Table 9.4 Neurologic Disorders

Brain tumor

Driving recommendations should be based on the type of tumor, its location and rate of growth, type of treatment, presence of seizures, and presence of cognitive or perceptual impairments. Because of the progressive nature of some tumors, serial evaluations of the individual's fitness to drive may be needed.

See also the stroke recommendations in Section 3.2.

If the older adult experiences seizure(s), see the seizure disorder recommendations below (4.10 in this section).

Closed head injury

Older adults should not drive until symptoms or signs have stabilized or resolved.

For individuals whose symptoms or signs resolve, driving may resume after medical assessment and, if deemed necessary by the clinician, a comprehensive driving evaluation (clinical and on road) performed by a DRS.

Older adults with residual neurologic or cognitive deficits should be managed as described in Section 3.

If the individual experiences seizure(s), see the seizure disorder recommendations below.

Dementia

The following recommendations are adapted from the Canadian Consensus Conference on Dementia and the Alzheimer's Association Policy Statement on Driving and Dementia (approved September 2011):

- A diagnosis of dementia is not, on its own, a sufficient reason to withdraw driving privileges. A significant number of drivers with dementia are found to be competent to drive in the early stages of their illness.⁵⁴ Therefore, the determining factor in withdrawing driving privileges should be the individual's driving ability. When the individual poses a heightened risk to self or others, driving privileges must be withheld.
- Clinicians should consider the risks associated with driving for all of their patients with dementia, and they are encouraged to address the issue of driving safety with these older adults and their caregivers as early in the

process as possible. When appropriate, older adults should be included in decisions about current or future driving restrictions and cessation; otherwise, clinicians and caregivers must decide in the best interests of the patient whose decision-making capacity is impaired.

- Clinicians are recommended to perform a focused medical assessment that includes a history of any new impaired driving behaviors (e.g., new motor vehicle crashes, moving violations) from a family member or caregiver and an evaluation of cognitive abilities, including attention, executive function, information processing speed, judgment, memory, and visuospatial abilities. Clinicians should be aware that older adults with a progressive dementia who are initially believed to be safe to drive will require serial assessment, and they should familiarize themselves with their State reporting laws and procedures for dementia (if any). (See Chapter 8 for resources for State reporting laws.)
- If concern exists that an older adult with dementia has impaired driving ability, and the individual would like to continue driving, a formal assessment of driving skills should be administered. One type of assessment is a comprehensive driving evaluation (clinical and on road) performed by a DRS.
- Clinicians should encourage older adults with progressive dementia and their caregivers to begin planning early in the clinical course for eventual cessation of driving privileges by exploring alternative transportation options and developing a plan for how to maintain out-of-home mobility and activity participation.

Migraine and other recurrent headache syndromes

Individuals with recurrent severe headaches should be cautioned against driving when experiencing neurologic manifestations (e.g., visual disturbances or dizziness), when distracted by pain, and while on any potentially PDI medication. Individuals without a typical aura preceding the acute attack may be at higher risk.

PDI medications: barbiturates, narcotics, narcotic-like analgesics (see Section 13)

Movement disorders (e.g., parkinsonism, dyskinesias)

If the clinician elicits complaints of interference with driving tasks or is concerned that the older adult's symptoms compromise his or her driving safety, referral to a DRS for a comprehensive driving evaluation (clinical and on road) is recommended.

Multiple sclerosis

Driving recommendations should be based on the type of symptoms and level of symptom involvement. Clinicians should be alert to deficits that may be subtle (e.g., muscle weakness, sensory loss, fatigue, cognitive or perceptual deficits, symptoms of optic neuritis) but have a strong potential to impair driving performance.

A comprehensive driving evaluation (clinical and on road) performed by a DRS may be useful in determining the ability to drive safely. Additionally, the DRS can recommend modification to the vehicle (e.g., hand controls, low-effort steering) that can extend the time for continued driving despite motor symptoms.

Serial evaluations may be required as the individual's symptoms evolve or progress.

Paraplegia and quadriplegia

Referral to a DRS is necessary if the individual wishes to resume driving and/or requires a vehicle modified to accommodate him or her as a passenger. The DRS can recommend an appropriate vehicle and prescribe vehicle adaptive devices (e.g., low-resistance power steering and hand controls) and train the individual in their use. In addition, the DRS can assist the individual with ability to access the vehicle, including opening and closing car doors, transfer to the car seat, and independent wheelchair stowage, through vehicle adaptations and training. With spinal cord injury, referral should be fairly early in the process so caregivers can have the time needed to secure an appropriate vehicle, because not all vehicles are adaptable for this level of impairment.⁵⁵

Driving should be restricted until the individual demonstrates safe driving ability in the adapted vehicle.

Parkinson disease

Older adults with Parkinson disease may be at increased risk of driving difficulties because of motor, visual, and cognitive dysfunction.⁵⁶ Clinicians should base their driving recommendations on the level of motor, visual, and cognitive symptom involvement; the individual's response to treatment; and presence and extent of any medication adverse effects. (See Section 13 for specific recommendations on antiparkinson medications.) Serial physical and cognitive evaluations are recommended every 6–12 months because of the progressive nature of the disease.

If the clinician is concerned that dementia, vision, and/or motor impairments may affect the older adult's driving skills, a comprehensive driving evaluation (clinical and on road) performed by a DRS may be useful in determining the individual's fitness to drive.

The following recommendations were affirmed at the AOTA/NHTSA Expert Summit (March 2012) specific to Parkinson disease:⁵⁷

1. Drivers with Parkinson disease who have mild motor disability as measured by low scores on the Unified Parkinson Disease Rating Scale (UPDRS) Part 3, and no or few risk factors (antiparkinson drugs, >75 years old) may be fit to drive. Individuals who fit this profile and those who are newly diagnosed with Parkinson disease are recommended to:
 - Plan a baseline comprehensive driving evaluation by a medically trained DRS
 - Because of the progressive nature of the disease, the individual should also:
 - Consider annual comprehensive driving evaluations.
 - Start planning for eventual driving cessation.
 - Seek consultation to develop a plan for use of alternative transportation options.
 - Start conversations with the family about retirement from driving.
2. For those with severe motor impairment and high disease severity (high UPDRS Part 3 scores) and multiple risk factors (e.g., decreased information processing speed, the highest risk score on the Useful Field of View, scoring 180 seconds or more on the Trails B, impaired contrast sensitivity, and

scoring >7 seconds on the Rapid Pace Walk), recommendations include:

- Cessation of driving
 - Reporting to the licensing agency as required/allowed by the jurisdiction
 - Addressing transportation options for the individual and caregiver through consultation or support services
3. Research is in progress to provide better guidelines for the middle group (i.e., those individuals with mild to moderate motor disability and few to several risk factors). Recommendations for this group include:
- Strongly recommending a comprehensive driving evaluation by a medically trained DRS to provide opportunities for rehabilitation (e.g., behind-the-wheel training, compensatory strategies, adaptive devices, driving restrictions, and/or self-regulation)
 - Providing strategies to address transitioning to non-driving (e.g., start conversations about driving retirement, caregiver involvement in driving retirement, consultation, and/or referral for counseling)

- Developing a mobility plan for driving cessation.

Peripheral neuropathy

Lower extremity deficits in sensation and proprioception may be exceedingly dangerous for driving, because the driver may be unable to control the foot pedals. If deficits in sensation and proprioception are identified, referral to a DRS is recommended. The DRS may prescribe vehicle adaptive devices (e.g., hand controls in place of the foot pedals) and train the individual in their use.

Seizure disorder

The recommendations below (in this section only) are adapted from the Consensus Statements on Driver Licensing in Epilepsy, developed and agreed on in March 1992 by the American Academy of Neurology, American Epilepsy Society, and Epilepsy Foundation of America.⁵⁸ These recommendations are subject to each State's licensing requirements and reporting laws.

A patient with seizure disorder should not drive until he or she has been seizure-free for 3 months. This recommendation appears consistent with available data.⁵⁹

This 3-month interval may be lengthened or shortened based

on the following favorable and unfavorable modifiers.

Favorable modifiers:

- Seizures occurred during medically directed medication changes
- Patient experiences only simple partial seizures that do not interfere with consciousness and/or motor control
- Seizures have consistent and prolonged aura, giving enough warning to refrain from driving
- There is an established pattern of purely nocturnal seizures
- Seizures are secondary to acute metabolic or toxic states that are not likely to recur
- Seizures were caused by sleep deprivation, and sleep deprivation is unlikely to recur
- Seizures are related to reversible acute illness

Unfavorable modifiers:

- Noncompliance with medication or medical visits and/or lack of credibility
- Alcohol and/or drug abuse in the past 3 months
- Increased number of seizures in the past year
- Impaired driving record
- Structural brain lesion
- Noncorrectable brain functional or metabolic condition
- Frequent seizures after seizure-free interval
- Prior crashes due to seizures in the past 5 years
- Single unprovoked seizure
- Vagal nerve stimulator implant for seizure control with extended adjustment period
- Three or more anti-epileptic drugs necessary to achieve seizure control

Single unprovoked seizure

The patient should not drive until he or she has been seizure-free for 3 months.

This time period may be shortened with clinician approval. Predictors of recurrent seizures that may preclude shortening of this time period include:

- The seizure was focal in origin.
- Focal or neurologic deficits predated the seizure.
- The seizure was associated with chronic diffuse brain dysfunction.
- The patient has a positive family history for epilepsy.
- Generalized spike waves or focal spikes are present on EEG recordings.

Withdrawal or change of anticonvulsant drug therapy

The patient should temporarily cease driving during the time of medication withdrawal or change because of the risk of recurrent seizure and PDI effects of the medication.

If there is significant risk of recurrent seizure during medication withdrawal or change, the patient should cease driving during this time and for at least 3 months thereafter.

If the patient experiences a seizure after medication withdrawal or change, he or she should not drive for 1 month after resuming a previously effective medication regimen. Alternatively, the patient should not drive for 6 months if he or she refuses to resume this medication regimen but is seizure-free during this period.

Sleep disorders

Narcolepsy

The older adult should cease driving once diagnosed but may resume driving after treatment when he or she no longer suffers excessive daytime drowsiness or cataplexy. Clinicians may consider using scoring tools such as the Epworth Sleepiness Scale to assess the individual's level of daytime drowsiness.⁶⁰

Sleep apnea

See Section 10.

Stroke

See Section 3.

Tourette syndrome

In evaluating the older adult's fitness to drive, clinicians should consider any comorbid disorders (including attention deficit hyperactivity disorder, learning disabilities, and anxiety disorder) in addition to the individual's motor tics. (For specific recommendations on these disorders, see Section 5, Psychiatric Disorders).

If the clinician is concerned that the older adult's symptoms compromise his or her driving safety, referral to a DRS for a comprehensive driving evaluation (clinical and on road) is recommended.

PDI medications: antipsychotics (see Section 13 for more information on medication adverse effects)

Vertigo

Older adults with acute vertigo should not drive until symptoms have fully resolved. Under no circumstances should the individual drive to seek medical attention.

Older adults with a chronic vertiginous disorder are strongly recommended to undergo on-road assessment performed by a DRS before resuming driving.

PDI medications: antivertigo agents (anticholinergic)

Section 5: Psychiatric Disorders

1. Affective disorders
 - a. Depression
 - b. Bipolar disorder
2. Anxiety disorders
3. Psychotic illness
 - a. Acute episodes
 - b. Chronic illness
4. Personality disorders
5. Substance abuse
6. Attention deficit disorder/attention deficit hyperactivity disorder
7. Tourette syndrome

Older adults in the acute phase of a psychiatric illness need to be aware that driving skills could be affected. In general, driving is safe when the condition is stable, although adverse effects from medications and compliance with the medication regimen may need to be taken into consideration. (For recommendations on medications and driving, see Section 13, Medications.)

Psychiatrists may wish to consult the American Psychiatric Association's Position Statement on the Role of Psychiatrists in Assessing Driving Ability.⁶¹

Table 9.5 Psychiatric Disorders

Affective disorders

Clinicians should advise older adults not to drive during the acute phase of illness.

PDI medications: antidepressants (see Section 13 for information on differences among antidepressants)

Depression

No restrictions if condition is mild and stable. Clinicians should always specifically ask about suicidal ideation and cognitive and motor symptoms.

Older adults should not drive if they are actively suicidal or experiencing significant mental or physical slowness, agitation, psychosis, impaired attention, and/or impaired concentration. Individuals should be counseled not to drive themselves to seek medical attention.

Bipolar disorder

No restrictions if condition is stable.

Older adults should not drive if they are actively suicidal, depressed as in 1.a (above) or in an acute phase of mania. Individuals should be counseled not to drive themselves to seek medical attention.

Anxiety disorders

Older adults should not drive during severe episodes of anxiety. Otherwise, there are no restrictions if the condition is stable.

PDI medications: benzodiazepines (see Section 13)

Psychotic illness

Clinicians should advise older adults not to drive during the acute phase(s) of illness.

PDI medications: antipsychotics, benzodiazepines

Acute episodes

Older adults should not drive during acute episodes of psychosis. Individuals with acute psychosis should be counseled not to drive themselves to seek medical attention.

Chronic illness

No restrictions if the condition is stable.

Personality disorders

No restrictions unless the older adult has a history of driving violations and his or her psychiatric review is unfavorable. This includes, but is not limited to, uncontrolled erratic, violent, aggressive, or irresponsible behavior.

Because of the high comorbidity of substance abuse with personality disorders, clinicians are urged to be alert to substance abuse in these individuals and counsel them accordingly (see recommendations for substance abuse below).

Substance abuse

Driving while intoxicated is illegal and highly dangerous to the driver, passengers, and other road users. Impaired driving is the most common crime in the United States, and it is responsible for thousands of traffic deaths each year.

Alcohol is not the only cause of intoxicated driving. Substances including, but not limited to, marijuana, cocaine, amphetamines (including amphetamine analogues), opiates, and benzodiazepines may also impair driving skills. Clinicians should query about prescription and/or nonprescription medication abuse as potential additional agents.

Clinicians should follow up all positive screens with appropriate interventions, including brief interventions or referral to support groups, counseling, and substance abuse treatment centers. Clinicians should strongly urge substance abusers to temporarily cease driving while they seek treatment, and to refrain from driving while under the influence of intoxicating substances. A nonjudgmental and supportive attitude and frequent follow-up may aid substance abusers in their efforts to achieve and maintain sobriety.

Clinicians should also familiarize themselves with any State laws or regulations regarding detaining intoxicated individuals who have driven to the hospital or clinic until they are legally unimpaired.

Attention deficit disorder/attention deficit hyperactivity disorder

A review noted increased risk of driving behaviors and a positive effect of stimulant medications on driving performance.⁶² Clinicians should educate older adults about the increased risk associated with the disease and the potential benefits of treatment.

Tourette syndrome

See Section 4.

Section 6: Metabolic Disorders

1. Diabetes mellitus
 - a. Insulin dependent diabetes mellitus (IDDM)
 - b. Non-insulin dependent diabetes mellitus (NIDDM)
2. Hypothyroidism
3. Hyperthyroidism

Older adults in the acute phase of a metabolic disorder (e.g., diabetes, Cushing disease, Addison disease, hyperfunction of the adrenal medulla, thyroid disorders) may experience signs and symptoms incompatible with safe driving. Clinicians should advise these individuals to refrain from driving (including driving to seek medical attention) until the symptoms have abated.

There are data that suggest that older adults with diabetes may be at increased risk of impaired driving, but the literature is not consistent in this area. Concern has been raised that the trend in the medical profession has been toward tighter control of blood glucose levels, which could result in hypoglycemia and possibly increased crash risk.

Table 9.6 Metabolic Disorders

Diabetes mellitus

Insulin dependent diabetes mellitus (IDDM)

No restrictions if the older adult demonstrates satisfactory control of his or her diabetes, recognizes the warning symptoms of hypoglycemia, and meets required visual standards.

The major concern is lack of awareness of hypoglycemia.

Several studies have noted that individuals with type 1 IDDM had impaired driving performance during episodes of

hypoglycemia and were unaware of their low blood glucose at the time of driving assessment.^{63,64}

It is apparent from these studies that many drivers did not take appropriate action even when they recognized the symptoms of hypoglycemia. Individuals with diabetes who use insulin should be evaluated for hypoglycemia and should consider checking their blood sugar before driving or on prolonged trips. This is especially the case for individuals who have exhibited lack of awareness of hypoglycemia (e.g., documented blood glucose below 60 mg/dL without symptoms).

Older adults should be counseled not to drive during acute hypoglycemic or hyperglycemic episodes. In addition, older adults are advised to keep candy or glucose tablets within reach in their car at all times, in the event of a hypoglycemic attack. A 2012 American Diabetes Association position statement highlights important considerations in identification and management for individuals with diabetes at potential risk of driving difficulties.⁶⁵

For peripheral neuropathy, see Section 4.

Older adults who experience recurrent hypoglycemic or hyperglycemic attacks should not drive until they have been free of significant hypoglycemic or hyperglycemic attacks for 3 months.

Non-insulin dependent diabetes mellitus (NIDDM) Older adults who are managed by lifestyle changes and/or oral medications have no restrictions unless they develop relevant conditions (e.g., diabetic retinopathy).

If the clinician prescribes an oral medication that has a significant potential to cause hypoglycemia, he or she should counsel the individual as for IDDM above. Oral medications may also increase the likelihood of hypoglycemia, which should be managed as in 1.a in this section.

Hypothyroidism

Older adults who experience symptoms (e.g., cognitive impairment, drowsiness, fatigue) that may compromise safe driving should be counseled not to drive until their hypothyroidism has been satisfactorily treated. If residual cognitive deficits are apparent despite treatment, a comprehensive driving evaluation (clinical and on road) performed by a DRS may be useful in determining the individual's ability to drive safely.

Hyperthyroidism

Older adults who experience symptoms (e.g., anxiety, tachycardia, palpitations) should be counseled not to drive until their hyperthyroidism has been satisfactorily treated and symptoms have resolved.

Section 7: Musculoskeletal Disorders

1. Arthritis
2. Foot abnormalities
3. Limitation of cervical movement
4. Limitation of thoracic and lumbar spine
5. Loss of extremities or loss of use of extremities
6. Muscle disorders
7. Orthopedic procedures/surgeries
 - a. Amputation
 - b. Anterior cruciate ligament reconstruction
 - c. Limb fractures and treatment involving splints and casts
 - d. Rotator cuff repair (open or arthroscopic)
 - e. Shoulder reconstruction
 - f. Total hip replacement
 - g. Total knee arthroplasty

Pain, decreased motor strength, and compromised range of motion associated with musculoskeletal disorders can affect an individual's ability to drive. Clinicians should encourage older adults with musculoskeletal disorders to drive a vehicle with power steering and automatic transmission. Such vehicles require the least amount of motor ability for operation among all standard vehicles. If the clinician is concerned that the individual's musculoskeletal disorders impair his or her driving performance, referral to a DRS for a comprehensive driving evaluation (clinical and on road) is also recommended. In addition to assessing the older adult's driving skills, the DRS can prescribe compensatory techniques and adaptive devices and train the individual in their use.

Older adults with musculoskeletal disorders, typically have problems with using the seat belt and ignition key, adjusting mirrors and seats, steering, transferring in and out of the car, driving in reverse, and using controls like the foot pedals.⁶⁶ Driving impairment has been correlated with the inability to reach above the shoulder.⁶⁷ Older adults with physical frailty or disabilities may be at increased risk of a crash^{68,69} and are more likely to be injured.⁷⁰ Presence of foot abnormalities, walking less than one block a day, and impaired left knee flexion have been associated with adverse driving events.⁶⁹ In one study, older participants involved in a crash were more likely to have difficulty walking one-quarter mile than controls; increased crash risk for drivers with a history of falls was also noted.⁷¹

An examination of medically impaired drivers in Utah found an increased crash risk for drivers with musculoskeletal disorders but not for those with muscle or motor weakness.⁷² In a Canadian longitudinal study, self-reported arthritis/rheumatism and back pain were associated with motor vehicle injuries.⁷³

Conversely, individuals with a specific diagnosis of osteoarthritis⁷⁴ were no more at risk of a crash than controls in one study. Also reassuring was a study noting no increase in crash risk of drivers with cars that had been adapted for their musculoskeletal restrictions.⁷⁵ Improvements in relevant physical abilities and driving performance have been noted with a physical conditioning program.⁷⁶

Older drivers are at increased risk of death and serious injury in motor vehicle crashes, in part due to age-related fragility.⁷⁷⁻⁷⁹ Therefore, clinicians should advise older adults to avoid driving in potentially risky situations, such as making unprotected left turns, and driving in unfamiliar areas or on suburban highways.⁸⁰

In sum, clinicians can play a role in diagnosing, managing, and referring older adults with musculoskeletal disorders, thereby helping to maintain driving privileges and improve traffic safety.

Rehabilitative therapies such as physical or occupational therapy and/or a consistent regimen of physical activity may improve the older adult's ability to drive and overall level of physical fitness.

Whenever possible, the use of narcotics, barbiturates, and muscle relaxants should be avoided or minimized in those individuals with musculoskeletal disorders who wish to continue driving. See Section 13 for recommendations on specific classes of medications.

Table 9.7 Musculoskeletal Disorders
Arthritis

If symptoms of arthritis compromise the older adult's driving safety, referral to a physical or occupational therapist for rehabilitative therapy and/or to a DRS for a comprehensive driving evaluation (clinical and on road) is recommended. The DRS may prescribe vehicle adaptive devices and train the individual in their use.

See below for specific recommendations on limitation of cervical movement or limitation of the thoracic or lumbar spine.

Foot abnormalities
nails,

Foot abnormalities (e.g., bunions, hammer toes, long toe calluses) that affect the older adult's dorsiflexion, plantar flexion, and/or contact with vehicle foot pedals should be addressed and treated, if possible. Consideration should be given to referral to a podiatrist. Older adults may also be referred to a DRS, who can prescribe vehicle adaptive devices and train the individual in their use.

Limitation of cervical movement

Some loss of head and neck movement is acceptable if the older adult has sufficient combined rotation and peripheral vision to accomplish driving tasks (e.g., turning, crossing intersections, parking, backing up) safely. The clinician may also refer the older adult to a physical or occupational therapist for rehabilitative therapy, and/or to a DRS, who can prescribe wide-angled mirrors and train the individual in their use.

Limitation of thoracic or lumbar spine

Older adults with marked deformity, who wear braces or body casts, or who have painfully restricted motion in their thoracic or lumbar regions should be referred to a DRS. The DRS can prescribe vehicle adaptive devices such as raised seats and wide-angled mirrors and train the individual in their use. The DRS can also prescribe seat belt adaptations as needed to improve the older adult's safety and comfort and to ensure that the individual is seated at least 10 inches from the vehicle air bags.

Older adults with acute spinal fractures, including compression fractures, should not drive until the fracture has been stabilized and painful symptoms cease to interfere with control of the motor vehicle. These types of fractures can be extremely painful and may require large doses of narcotics for control of pain, which also can increase risk.

For paraplegia or quadriplegia, see Section 4.

Loss of extremities or loss of use of extremities

For older adults who have lost (or lost the use) of one or more extremities, referral to a DRS is highly recommended. The DRS can prescribe vehicle adaptive devices and/or adaptations to limb prostheses, and train the individual in their use. For example, those who have loss of the right lower extremity may be able to use a left foot accelerator. For those with an absent, amputated or non-functioning hand, a spinner knob may be recommended.

The use of artificial limbs on vehicle foot pedals is unsafe because of the lack of sensory feedback (i.e., pressure and proprioception). For these individuals, specialized hand controls in place of pedals are required.

Driving should be restricted until the older adult demonstrates safe driving ability (with the use of adaptive devices, as needed).

Muscle disorders

If the clinician is concerned that the older adult's symptoms compromise his or her driving safety, referral to a DRS for a comprehensive driving evaluation (clinical and on road) is recommended. If needed, the DRS may prescribe vehicle adaptive devices and train the individual in their use.

Orthopedic procedures/surgeries

<i>Amputation</i>	See Loss of extremities (above).
<i>Anterior cruciate ligament (ACL) reconstruction</i>	Individuals should not drive for 4 weeks after right ACL reconstruction. If the older adult drives a vehicle with manual transmission, he or she should not drive for 4 weeks after right or left ACL reconstruction. ⁸¹
<i>Limb fractures and treatment involving splints and casts</i>	<p>No restrictions if the fracture or splint/cast does not interfere with driving tasks.</p> <p>If the fracture or splint/cast interferes with driving tasks for any reason, such as the lack of sensory feedback (i.e., pressure and proprioception), the older adult may resume driving after the fracture heals or the splint/cast is removed, after demonstration of the necessary strength and range of motion.</p>
<i>Rotator cuff repair (open or arthroscopic)</i>	<p>Individuals should not drive for 4–6 weeks after rotator cuff repair. If the older adult's vehicle does not have power steering, the waiting period may be much longer.</p> <p>Physicians should counsel individuals to wear their seat belts properly (over the shoulder, rather than under the arm) whenever they are in a vehicle as a driver or passenger.</p>
<i>Shoulder reconstruction</i>	<p>Individuals should not drive for 4–6 weeks after shoulder reconstruction. If the older adult's vehicle does not have power steering, the waiting period may be much longer.</p> <p>Clinicians should counsel individuals to wear their seat belts properly (over the shoulder, rather than under the arm) whenever they are in a vehicle as a driver or passenger.</p>

<i>Total hip replacement</i>	<p>Individuals should not drive for at least 4 weeks after right total hip replacement.</p> <p>If the older adult drives a vehicle with manual transmission, he or she should not drive for at least 4 weeks after right or left total hip replacement.</p> <p>Clinicians should counsel older adults to take special care when transferring into vehicles and positioning themselves in bucket seats and/or low vehicles, either of which may result in hip flexion greater than 90 degrees. Clinicians should also counsel individuals that reaction time may not return to baseline until 8 weeks after the surgery, and that they should exercise extra caution while driving during this period.⁸²</p>
<i>Total knee arthroplasty (TKA)</i>	<p>Individuals should not drive for 3-4 weeks after right TKA. If the older adult drives a vehicle with manual transmission, he or she should not drive for 3-4 weeks after right or left TKA. The clinician should also counsel individuals that reaction time may not fully return to baseline until 8 weeks after the surgery and that extra caution should be exercised while driving during this period.⁸³⁻⁸⁹</p>

Section 8: Peripheral Vascular Disorders

1. Aortic aneurysm
2. Deep vein thrombosis
3. Peripheral arterial aneurysm

Table 9.8 Peripheral Vascular Disorders

Aortic aneurysm	<p>No restrictions to driving unless other disqualifying conditions are present. Individuals whose aneurysm appears to be at the stage of imminent rupture based on size, location, and/or recent change should not drive until the aneurysm has been repaired, if possible.</p>
------------------------	--

Deep vein thrombosis (DVT)

Older adults with acute DVT may resume driving when their international normalized ratio (INR) is therapeutic (or the risk of embolism is otherwise appropriately treated), and they can demonstrate adequate ankle dorsiflexion.

Clinicians should advise individuals with a history of DVT to take frequent “mobilization breaks” when driving long distances.

Peripheral arterial aneurysm

No restrictions unless other disqualifying conditions are present. Older adults whose aneurysm appears to be at the stage of imminent rupture based on size, location, and/or recent change should not drive until the aneurysm has been repaired, if possible.

Section 9: Renal Disorders

1. Chronic renal failure
2. Time-limited restrictions: renal transplant

Table 9.9 Renal Disorders**Chronic renal failure**

No restrictions unless the older adult experiences symptoms incompatible with safe driving (e.g., cognitive impairment, impaired psychomotor function, seizures, extreme fatigue from anemia). If the clinician is concerned that the individual’s symptoms compromise his or her driving safety, referral to a DRS for a comprehensive driving evaluation (clinical and on road) is recommended.

Many older adults with renal failure requiring hemodialysis can drive without restriction. However, management of renal failure requires that the older adult be compliant with substantial nutrition and fluid restrictions, frequent medical evaluations, and regular hemodialysis treatments. Individuals with a history of noncompliance should be advised against driving. Furthermore, certain medications used to treat adverse effects of hemodialysis may be substantially impairing (e.g., diphenhydramine for dialysis-associated pruritus), and dialysis itself may result in hypotension, confusion, or agitation in many people. These effects may require that older adults avoid driving in the immediate post-dialysis period.

Renal transplant

Older adults may resume driving 4 weeks after successful renal transplant on the recommendation of the physician.

Section 10: Respiratory and Sleep Disorders

1. Asthma
2. Chronic obstructive pulmonary disease (COPD)
3. Sleep apnea

“Drowsy driving” or driving with fatigue or sleepiness is a common cause of a motor vehicle crash, and some estimate that more than 100,000 crashes a year may be attributed to this problem.

Crash risk increases with diminishing sleep.⁹⁰ Sleep disorder crash risk may be increased further by medication use, such as narcotics or antihistamines.⁹¹ Individuals with sleep apnea have been noted to have as high as a 7-fold increased crash risk compared with controls depending on the study.⁹² Individuals with these disorders may also be at increased risk of injurious crashes.⁹³ This topic has been extensively reviewed elsewhere.¹ Obstructive sleep apnea is one of the few medical conditions for which treatment has been shown to return crash risk to baseline levels.⁹⁴ In addition, recent studies indicate a high prevalence of sleep disorders or daytime sleepiness in older adults⁹⁵ and in individuals with diabetes.⁹⁶ However, in the case of older adults, the effect on driving safety is unclear.⁹⁷

Table 9.10 Respiratory and Sleep Disorders

Asthma

No restrictions.

Older adults should be counseled not to drive during acute asthma attacks, or while suffering transient adverse effects (if any) from asthma medications.

Chronic obstructive
pulmonary disease (COPD)

No restrictions if symptoms are well controlled, and the older adult does not experience any significant adverse effects from the condition or medication.

The older adult should not drive if he or she suffers dyspnea at rest or at the wheel (even with the use of supplemental oxygen), excessive fatigue, or significant cognitive impairment. If the older adult requires supplemental oxygen to maintain a hemoglobin saturation of $\geq 90\%$, he or she should be counseled to use the oxygen at all times while driving. Because of the often tenuous oxygenation status of these individuals, they should also be counseled to avoid driving when they have other respiratory symptoms that may indicate concomitant illness or exacerbation of COPD (e.g., new cough, increased sputum production, change in sputum color, fever).

The following recommendations were affirmed at the AOTA/NHTSA Expert Summit (March 2012) specific to COPD:⁵⁵

- When an individual has COPD, a referral for a driving evaluation is indicated if any of the following conditions are present: (1) cognitive decline is evident with either psychometric testing or while performing other ADLs (e.g., impaired attention, fatigue, hypersomnolence); (2) concern is raised about driving safety through direct observation, family concern, or driving incidents; (3) the individual has difficulty maintaining oxygen saturation of at least 90% at rest; (4) when the individual experiences dyspnea at rest or while behind the wheel; and 5) when the individual's motor vehicle needs modification for loading a powered mobility device (wheelchair or scooter) or oxygen containers need to be secured in the vehicle.
- When an individual has COPD, the DRS should monitor oxygen saturation while driving to measure the effects of driving tasks on oxygen levels in the blood. This information can be used to verify the need to drive with oxygen to improve cognition, as well as heart and other organ functioning. Pulse oximetry is also an effective tool to demonstrate the effects that energy conservation (vehicle features, arm position, etc.) and breathing techniques have while driving.
- When an individual has COPD, the DRS can provide guidance on overall driving skills and safety, including driving limits and compensatory techniques, as well as assistance with loading

- devices for power mobility devices, and oxygen storage.
- Community mobility should be addressed with every occupational therapy patient as part of the initial evaluation and most importantly as part of discharge planning.

Because COPD is often progressive, periodic reevaluation for symptoms and oxygenation status is recommended.

If the clinician is concerned that the older adult's symptoms compromise his or her driving safety, referral to a DRS for a comprehensive driving evaluation (clinical and on road) is recommended. The individual's oxygen saturation may be measured during the course of the on-road assessment to provide additional information for management.

Sleep apnea

Older adults with excessive daytime sleepiness, loud snoring (particularly if accompanied by witnessed apneic events), large neck circumference (≥ 16 inches in women, ≥ 17 inches in men), increased body mass index ($>35 \text{ kg/m}^2$), and/or hypertension that requires two or more medications should be considered at risk of obstructive sleep apnea, and formal sleep study evaluation should be considered, especially in any individual who reports having fallen asleep while driving a vehicle. A person diagnosed with sleep apnea (apnea/hypopnea index ≥ 5) who has fallen asleep while driving, or a person with severe obstructive sleep apnea (apnea/hypopnea index of ≥ 30) should be counseled to refrain from driving until he or she is receiving effective treatment (via a positive airway pressure device) after a formal sleep study to confirm the diagnosis. If these individuals undergo other treatments (surgery, oral appliances), they should be advised to have a post-treatment sleep study to confirm effectiveness. Clinicians should counsel older adults prescribed positive airway pressure devices that they should not drive if they do not use the device unless a formal sleep study confirms resolution of their obstructive sleep apnea (e.g., after substantial weight loss).

Section 11: Effects of Anesthesia and Surgery

1. Abdominal, back, and chest surgery
2. Anesthesia
 - a. General

- b. Local
- c. Epidural
- d. Spinal
- 3. Neurosurgery
- 4. Orthopedic surgery

Clinicians should be alert to peri- and postoperative risk factors that may affect the older adult's cognitive function after surgery, or restrictions on limb movement or joint range of motion that place the individual at risk of impaired driving performance. Risk factors include:

- Preexisting cognitive impairment
- Duration of surgery
- Age (>60 years old)
- Altered mental status after surgery
- Presence of multiple comorbidities
- Emergency surgery

If the clinician is concerned that residual visual, cognitive, or motor deficits after surgery may impair the older adult's driving performance, referral to a DRS for a comprehensive driving evaluation (clinical and on road) is highly recommended.

Clinicians should counsel older adults who undergo surgery—both inpatient and outpatient—not to drive themselves home after the procedure. Although they may feel capable of driving, their driving skills may be affected by pain, physical restrictions, anesthesia, cognitive impairment, and/or analgesics. (For specific recommendations on musculoskeletal restrictions and narcotic analgesics, see Sections 7 and 13, respectively.)

In counseling older adults about their return to driving after a surgical procedure, clinicians may find it useful to ask whether the individual's car has power steering and automatic transmission. Advice can then be tailored accordingly.

As older adults resume driving, they should be counseled to assess their comfort level in familiar, traffic-free areas before driving in heavy traffic. Those who feel uncomfortable driving in certain situations should avoid these situations until their confidence level has returned. Older adults should never resume driving before they feel ready to do so and have received approval from the clinician.

Table 9.11 Effects of Anesthesia and Surgery

Abdominal, back, and chest surgery

Older adults may resume driving after demonstrating the necessary strength and range of motion needed for driving.

See Section 2 for recommendations for surgeries involving median sternotomy.

Anesthesia

Because anesthetic agents and adjunctive compounds (such as benzodiazepines) may be administered in combination, older adults should not resume driving until the motor and cognitive effects from all anesthetic agents have subsided.

General

Both the surgeon and anesthesiologist should advise older adults against driving for at least 24 hours after a general anesthetic has been administered. Longer periods of driving cessation may be recommended depending on the procedure performed and the presence of complications.

Local

If the anesthetized region is necessary for driving tasks, the older adult should not drive until he or she has recovered full strength and sensation (barring pain).

Epidural

Older adults may resume driving after recovering full strength and sensation (barring pain) in the affected areas.

Spinal

Older adults may resume driving after recovering full strength and sensation (barring pain) in the affected areas.

Neurosurgery

See recommendations for post-intracranial surgery in Section 3.

Orthopedic surgery

See the recommendations for orthopedic procedures/surgeries in Section 7.

Section 12: Cancer

Table 9.12 Cancer

Cancer

Older adults who experience significant motor weakness or cognitive impairments from the cancer itself, metastases, cachexia, anemia, radiation therapy, and/or chemotherapy, which can cause cognitive impairment and/or neuropathy, should cease driving until their condition improves and stabilizes.

Many medications prescribed to relieve the adverse effects of cancer treatment (e.g., antiemetics for nausea) may impair driving performance. Clinicians should counsel older adults accordingly. (See Section 13 for recommendations for specific medications.)

Section 13: Medications

1. Anticholinergics
2. Anticonvulsants
3. Antidepressants
4. Antiemetics
5. Antihistamines
6. Antiparkinson agents
7. Antipsychotics
8. Benzodiazepines and nonbenzodiazepine hypnotics
9. Muscle relaxants
10. Narcotic analgesics

As described in the previous sections of this chapter, medications may promote safe driving in older adults through adequate management of medical conditions and better physical functioning. However, many commonly used prescription and over-the-counter medications may impair driving by adversely affecting the cognitive, visual, and/or motor abilities needed for safe driving. In general, any drug with a prominent effect on the central nervous system (CNS) has the *potential* to impair an individual's ability to operate a motor vehicle. The level of impairment varies from person to person and between different medications within the same therapeutic class.

Expert panels convened by NHTSA to develop a list of safe and unsafe drugs with regard to driving were not able to develop a conclusive list and were only able to comment on the *potential* impact of various medications.⁹⁸ This difficulty stems from inconsistent research findings, lack of a standardized protocol for assessing the potential for medications to impair driving, and the difficulty in distinguishing the impact of the medical condition from the impact of the medication itself that is used to treat the medical condition on driving safety.⁹⁸ For studies that have taken into account both the medical condition and the medications used to treat the condition, the impact of the medical condition on crash risk is much stronger than that of the medication.⁹⁸ Thus, this section discusses potentially driver-impairing (PDI) medications based on information from observational studies examining risk of crashes; from experimental studies assessing driving performance, as tested in different actual driving tests or driving simulator tests; and/or from the known adverse effect profile of the medication. Some PDI medications are included based on adverse-effect profile alone, because research evidence is not available delineating risk of traffic crashes.

The most common PDI medications include the anticholinergics, anticonvulsants, antidepressants, antiemetics, antihistamines, antipsychotics, barbiturates, benzodiazepines/hypnotics, muscle relaxants, and narcotic analgesics.⁹⁹⁻¹⁰¹ Of these medication classes, benzodiazepines have been subject to the most scrutiny, and studies have consistently found higher risk of traffic crashes associated with their use in older adults.^{99,100}

Older adults often take multiple medications concurrently, with approximately 30% using five or more prescription medications.¹⁰² Crash risk is likely to increase with use of multiple PDI medications¹⁰³ or concomitant use with alcohol. Table 9.13 summarizes the common PDI medications and the specific adverse effects (cognitive, visual, and motor abilities) that may contribute to impaired driving. Adverse effects on cognition include fatigue, sedation/sleepiness, light-headedness, dizziness, or global cognitive impairment (e.g., impaired judgment, attention, psychomotor speed). Medications that cause tremor, dyskinesias, or extrapyramidal symptoms may impair motor ability needed for driving. A history of falls has been associated with an increased crash risk, and medications with CNS effects are known risk factors for falls. Medications that cause drowsiness, euphoria, and/or anterograde amnesia may also diminish insight, and older adults may experience impairment without being aware of it (e.g., benzodiazepines, narcotics, antihistamines).^{104–107} This list of medications is not exhaustive. Other medication classes, such as oral hypoglycemics and antihypertensives, may cause dizziness or impaired cognition if the individual is hypoglycemic or blood pressure is too low, respectively. Furthermore, any medication side effect (e.g., nausea) that reduces the ability to concentrate could potentially impair driving.

Table 9.13 Potentially Driver-Impairing (PDI) Medications

Medication Class	PDI Symptom
Anticholinergics	Sedation, blurred vision, impaired cognition
Anticonvulsants	Sedation, impaired cognition
Antidepressants	
Tricyclics (tertiary more impairing than secondary)	Sedation, blurred vision, impaired cognition, tremor, heart palpitations
Selective serotonin reuptake inhibitors (SSRIs)	Impaired concentration, lightheadedness, tremor
Others	
Duloxetine	Sedation
Mirtazapine	Sedation
Bupropion	Insomnia (leading to next day somnolence)
Antihistamines (first generation and cetirizine)	Sedation, blurred vision, impaired cognition
Antiparkinson agents Dopamine agonists, levodopa, Anticholinergics	All classes may cause sedation. Medication-specific adverse events: sleep-attacks (most likely with dopamine agonists), dyskinesias (most likely with levodopa)
Antipsychotics	Sedation, blurred vision, impaired cognition, extrapyramidal symptoms, (to varying extent among agents)

Table 9.13 Potentially Driver-Impairing (PDI) Medications

Medication Class	PDI Symptom
Benzodiazepines/sedatives	Sedation, clumsiness, dizziness, impaired vision, impaired cognition
Muscle relaxants	Sedation, blurred vision, impaired cognition
Opioid analgesics	Sedation, lightheadedness, impaired vision
<i>Other agents not discussed in text</i>	
Antihypertensives	Dizziness (low blood pressure) CNS effects (guanfacine, reserpine, methyldopa, clonidine)
Hypoglycemics	Symptoms of hypoglycemia (shakiness, impaired concentration, lightheadedness)
Indomethacin	CNS effects

Clinicians should be aware of the PDI risk and attempt to use the safest class of medication when possible. It is difficult to know whether increased risk of impaired driving is associated with the drug (e.g., antidepressant), the disease itself (e.g., depression, which may independently impair attention, judgment), or a drug-drug interaction.⁹⁹ Because of age-related changes in pharmacokinetics (e.g., reduced renal function) and pharmacodynamics, older adults may begin to have adverse effects to medications that they have tolerated well for many years, which may make it difficult to ascertain the cause of new PDI symptoms.

Alcohol Interaction with Medications

As little as one serving of alcohol (1.25 oz. 80-proof liquor, 12 oz. beer, 5 oz. wine) has the potential to impair driving performance in many individuals. Because of age-related changes in body composition (e.g., increased body fat and decreased lean muscle mass), the same weight-adjusted amount of alcohol (hydrophilic) is likely to result in higher blood levels of alcohol and functional impairment in advanced age. In many cases, older adults may be impaired without being aware of it. Furthermore, alcohol can potentiate the CNS effects of PDI medications to produce profound and dangerous levels of impairment. Clinicians should always warn older adults against drinking and driving, and against combining alcohol and their CNS-active medications.

General Prescribing Principles

It may not be possible to avoid use of PDI medications in older adults; however, several general prescribing principles can be considered to minimize risk.

1. Whenever possible, clinicians should select nonimpairing medications.
2. When prescribing new medications, clinicians should always consider the individual's

existing regimen of prescription and nonprescription medications and consider risk of additive PDI medications. Combinations of drugs may affect drug metabolism and excretion, and produce additive or synergistic interactions to impair driving ability.

3. Clinicians should add new medications at the lowest dosage possible, counsel the older adult to be alert to any impairing effects, and adjust the dosages as needed to achieve therapeutic effects while minimizing driving impairment. For individuals on multiple PDI medications, it is wise to start with low doses of each and gradually increase the dosage of each one at a time to minimize substantial undesirable effects.
4. Older adults should be regularly assessed for PDI symptoms during follow-up visits.
5. If medication therapy is initiated while the older adult is hospitalized, the impact of adverse effects on driving performance should be discussed before discharge.
6. These precautions and discussions should be documented in the health record.
7. If there is a question of cognitive or motor impairment, whether or not due to medications, the clinician should consider referral to a DRS for a driver evaluation (potentially including on-road assessment).

Counseling Considerations

The following counseling points are important to consider when a new PDI medication is started, or the dosage of an existing PDI medication is increased.

1. Inform the older adult and caregivers about the specific effects of the medication, so that they know what to expect and can self-monitor for adverse events that may affect driving.
2. Advise the older adult and caregivers to take the first few doses in a safe environment to determine the presence and extent of any adverse effects. Individuals should be advised not to drive during the initial phase of PDI dosage adjustment(s) if they experience drowsiness, lightheadedness, or other undesirable effects that may impair driving performance.
3. Inform the older adult and caregivers that some medications that cause drowsiness, euphoria, and/or anterograde amnesia may also diminish insight (benzodiazepines, antihistamines, narcotics), and that the individual may experience impairment without being aware of it.
4. Discourage the use of alcohol while driving and inform the older adult and caregivers about the potential for exacerbation of the PDI effects of certain medications with concomitant alcohol use.

Table 9.14 Medications

Refer to Table 9.13 for a full list of the PDI symptoms for each of the medication classes discussed below.

Anticholinergics

Many prescription and over-the-counter medications have anticholinergic effects.(see reference for a full list).¹⁰⁸ These include several medication classes such as antidepressants (e.g., tricyclic antidepressants and paroxetine), medications for overactive bladder (e.g., oxybutynin, tolterodine, trospium,

darifenacin), first generation antihistamines used for allergies, insomnia, and/or vertigo (e.g., chlorpheniramine, dimenhydrinate, diphenhydramine, doxylamine), skeletal muscle relaxants (e.g., cyclobenzaprine), gastrointestinal antispasmodics (e.g., belladonna alkaloids, atropine, hyoscyamine), certain antipsychotics (e.g., chlorpromazine, clozapine, olanzapine), and antiparkinson agents (e.g., trihexyphenidyl). In most cases, therapeutic alternatives to anticholinergic medications are available.

Subtle deficits in attention, memory, and reasoning may occur with therapeutic dosages of anticholinergic drugs without signs of overt toxicity. Delirium can also occur in older adults.

Anticonvulsants

Older adults should temporarily cease driving during the time of medication initiation, withdrawal, or dosage change because of the risk of recurrent seizure and/or potential medication effects that may impair driving performance.

If there is significant risk of recurrent seizure during medication withdrawal or change, the older adult should not drive during this time and for at least 3 months thereafter.

Many anticonvulsants (e.g., valproic acid, carbamazepine, gabapentin, lamotrigine, topiramate) are also used as mood stabilizers for treatment of bipolar disorder, for agitation in dementia, as sedating agents for anxiety, and to treat pain syndromes. These agents may be used as an adjunct to antidepressants, antipsychotics, and/or anxiolytics.

By themselves, anticonvulsants may be mildly impairing, but when combined with other PDI medications, the effects on psychomotor performance may be enhanced. Furthermore, some anticonvulsants are primarily eliminated by the kidneys and increased CNS adverse effects may be observed with renal impairment. Thus, dose reductions are recommended when estimated creatinine clearance is <60 mL/min for pregabalin and gabapentin and <80 mL/min for levetiracetam.¹⁰⁸

Antidepressants

In general, increased crash risk has been associated with many classes of antidepressants, even though the magnitude and extent of PDI adverse events vary between them. In general, the selective serotonin-reuptake inhibitors (SSRIs) are first-line agents for depression and anxiety disorders because of their good tolerability, including a lower risk of CNS depressant adverse effects. Tricyclic antidepressants with high anticholinergic effects are not advised for those who wish to continue driving. Mirtazapine, a more sedating antidepressant, is typically taken only at night to avoid excessive daytime sedation. Duloxetine, a serotonin-norepinephrine reuptake inhibitor used for depression, chronic pain, fibromyalgia, and anxiety disorders, may also cause sedation and other CNS effects.

Selective serotonin-reuptake inhibitors (SSRIs)

SSRIs are commonly prescribed agents to treat depression and anxiety. Paroxetine is unique in that it has anticholinergic effects, so may be more likely than the other SSRIs (e.g., sertraline, citalopram) to impair driving. Although adverse effects tend to be mild and well tolerated, clinicians should counsel older adults to be alert to the potential of SSRIs to affect driving performance. Special mention is made of the serotonin syndrome, wherein mental status changes, autonomic hyperactivity, and neuromuscular adverse effects are observed due to excessive amounts of the drug, taking multiple drugs that increase serotonin, or a drug-drug interaction.

Tricyclic antidepressants (TCAs)

Better tolerated agents have replaced TCAs for depression; however, they are still used to manage sleep, menopausal symptoms, neuropathic pain, incontinence, and migraines. The tertiary tricyclic antidepressants (amitriptyline, doxepin, imipramine) have strong anticholinergic effects and may impair driving. If a TCA is needed, nortriptyline and desipramine have lower anticholinergic effects and are preferred, but are still not recommended for use in older adults.¹⁰⁸

See Anticholinergics in this section.

Antiemetics

Numerous classes of drugs (some of which include anticholinergics, antihistamines, antipsychotics, cannabinoids, and benzodiazepines) are used for their antiemetic effect.

For more information, see Anticholinergics, Antihistamines, and Benzodiazepines in this section.

Antihistamines

The first-generation antihistamines (e.g., diphenhydramine, chlorpheniramine) have pronounced CNS effects and impair psychomotor performance, simulated driving, and on-road driving.⁹⁹ In contrast, most second-generation antihistamines (i.e., nonsedating) do not produce these types of impairments when taken in recommended doses, except for cetirizine. Nonsedating antihistamines (e.g., loratadine, fexofenadine) are preferred if an antihistamine is needed for allergy treatment, however even these agents may cause impairments if taken in higher-than-recommended doses.

See Anticholinergics in this section.

Antiparkinson agents

The mainstay of treatment for Parkinson disease is levodopa, dopamine agonists (e.g., pramipexole, ropinirole), amantadine, and anticholinergics (e.g., trihexyphenidyl). Individuals with Parkinson disease are already at risk for excessive daytime somnolence, but treatment with these medications can further contribute to this symptom. Individuals taking antiparkinson agents have reported sudden, unexpected lapses of attention and falling asleep, known as “sleep attacks.” The risk of sleep attacks seems greatest with use of dopamine agonists but may occur with any therapy.^{109,110}

Antipsychotics

Most, if not all, antipsychotic medications have a strong potential to impair driving performance through cognitive, visual, and motor effects. Most antipsychotics used in the outpatient setting are second-generation (atypical) antipsychotics. Second-generation antipsychotics have varying degrees of anticholinergic and sedative effects, with clozapine having the most pronounced effects. These agents also cause varying degrees of extrapyramidal effects that may impair psychomotor performance, with risperidone,

lurasidone, and ziprasidone having the most pronounced effects.

Benzodiazepines and nonbenzodiazepine hypnotics

Studies have demonstrated impairments in vision, attention, motor coordination, and driving performance with benzodiazepine use. Evening doses of long-acting benzodiazepines (e.g., flurazepam, diazepam) markedly impair psychomotor function the following day, while comparable doses of short-acting benzodiazepines produce a lesser impairment.⁹⁹ Zolpidem, eszopiclone, and zaleplon are nonbenzodiazepine hypnotics. Zolpidem has been associated with driving at night without recollection the next morning and increased crash risk.¹¹¹ Women and older adults have higher blood concentrations of zolpidem, therefore the maximum dose is lower for these patient groups (5 mg of regular release zolpidem). Less information exists about eszopiclone, but it has a duration of action similar to that of zolpidem, so the same cautions should apply. Zaleplon has a short half-life and is used for sleep-onset difficulties and is unlikely to impair next day driving. Trazodone, an antidepressant often used as a sedative, has been associated with increased crash risk.¹¹¹

In general, it is recommended to avoid benzodiazepines and nonbenzodiazepine hypnotics in older adults because of the risk of several adverse health outcomes, including increased risk of car crashes.¹⁰⁸ However, if hypnotics are needed, evening doses of short-acting hypnotics are preferred with periodic attempts to discontinue therapy. Individuals taking hypnotics should allow enough time to sleep after the dose (approximately 8 hours) before driving. Older adults who take daytime doses of benzodiazepines (for anxiety) should be advised of the potential for impairment, even in the absence of subjective symptoms.

Muscle relaxants

Most skeletal muscle relaxants (e.g., carisoprodol and cyclobenzaprine) have significant CNS effects. Long-term use should be avoided.

Narcotics analgesics

Tolerance may develop to many of the CNS effects of narcotic analgesics, but the visual impairment may persist. Impaired driving with narcotics may be most prominent with initial therapy or with dose increases. Meperidine may have a higher risk of neurotoxicity compared with other narcotics, and in general should be avoided in older adults.¹⁰⁸ Individuals should be monitored for frequency of use, tolerance, and dependence.

Clinicians should always be alert to signs of abuse. (For more information, see the recommendations for substance abuse in Section 5.)

References

1. Charlton, J., Koppel, S., Odell, M., Devlin, A., Langford, J., O'Hare, M., ... Scully, M. (2010, November). Influence of chronic illness on crash involvement of motor vehicle drivers (Report No. 300). Victoria, AU: Monash University Accident Research Centre.
2. Dobbs, B. M. (2005, September). Medical conditions and driving: A review of the literature (1960–2000) (Report No. DOT HS 809 690). Washington DC: National Highway Traffic Safety Administration. Available at www.nhtsa.gov/people/injury/-research/Medical_Condition_Driving/Medical%20Cond%20809%20690-8-04_Medical%20Cond%20809%20690-8-04.pdf
3. Staplin, L., Lococo, K. H., Martell, C., & Stutts, J. (2012, February). Taxonomy of Older Driver Behaviors and Crash Risk (Report No. DOT HS 811 468A). Washington, DC: National Highway Traffic Safety Administration. Available at www.nhtsa.gov/staticfiles/nti/pdf/811468a.pdf
4. National Highway Traffic Safety Administration. (2009, September). Driver fitness medical guidelines (Report No. DOT HS 811 210). Washington, DC: Author. Available at http://ntl.bts.gov/lib/31000/31100/31148/6061_MedicalReviewGuide_10-1_v2a.pdf
5. Austroads. (2012). *Assessing Fitness to Drive for Commercial and Private Vehicle Drivers*. Medical Standards for Licensing and Clinical Management Guidelines. Sydney, Australia: Austroads Ltd.
6. Canadian Medical Association. (2012). *CMA Driver's Guide: Determining Medical Fitness to Operate Motor Vehicles*, 8th edition. Ottawa, Ontario: Canadian Medical Association, p 49.
7. Road Safety Authority. (2014). *Medical Fitness to Drive Guidelines*, 3rd edition. Dublin, Ireland: Road Safety Authority.
8. Drivers Medical Group DVLA. (2014). *For Medical Practitioners: At a Glance Guide to the Current Medical Standards of Fitness to Drive*. Swansea, UK: Driver & Vehicle Licensing Agency.
9. Shinar, D., & Schieber F. (1991). Visual requirements for safety and mobility of older drivers. *Human Factors*, 33(5), 507–519.
10. Mabtyjari. M., & Tuppurainen, K. (1999). Cataracts in traffic. *Graefe's Archive for Clinical and Experimental Ophthalmology*, 237, 278–282.

11. Szlyk J. P., Mahler C. L., Seiple, W., Edward, D. P., & Wilensky, J.T. (2005). Driving performance of glaucoma patients correlates with peripheral visual field loss. *Journal of Glaucoma*, 14, 145–150.
12. Smith, B., T., Joseph D. P., & Grand, M. G. (2007). Treatment of neovascular age-related macular degeneration: past, present, and future directions. *Current Opinion in Ophthalmology*, 18, 240–244.
13. Leske, M. C., Hejl, A., Hussein, M., Bengtsson, B., Hyman, L., & Komaroff, E. (2003). Factors for glaucoma progression and the effect of treatment: the Early Manifest Glaucoma Trial. *Archives of Ophthalmology [now JAMA Ophthalmology]*, 121, 48–56.
14. Van Den Berg, T. J., Van Rijn, L. J., Rene, M., Heine, C., Coeckelbergh, T., Nischler, C., ... Franssen, L. (2007). Straylight effects with aging and lens extraction. *American Journal of Ophthalmology*, 144(3), 358–363.
15. Owsley, C., McGwin, G. Jr., Sloane, M., Wells, J., Stalvey, B. T., & Gauthreaux, S. (2002). Impact of cataract surgery on motor vehicle crash involvement by older adults. *Journal of the American Medical Association*, 288, 841–849.
16. Adler, G., Bauer, M. J., Rottunda, S., & Kuskowski, M. (2005). Driving habits and patterns in older men with glaucoma. *Social Work Health Care*, 40(3), 75–87.
17. Low Vision Centers of Indiana. (n.d.) Bioptic Driving State Laws (Web page). Retrieved from the center's website at www.biopicdrivingusa.com/state-laws/
18. Peli, E., & Peli, D. (2002). *Driving With Confidence: A Practical Guide to Driving With Low Vision*. Singapore: World Scientific Publishing Co. Pte. Ltd., , pp 20-22, 25, 100–101.
19. Owsley, C., Stalvey, B. T., Wells, J., Sloane, M. E., & McGwin, G. Jr. (2001). Visual risk factors for crash involvement in older drivers with cataract. *Archives of Ophthalmology*, 119, 881–887.
20. Owsley, C., & McGwin, G. (2010). Vision and driving. *Vision Research*, 50, 2348–2361.
21. Green, K. A., McGwin, G., & Owsley C. (2013). Associations between visual, hearing, and dual sensory impairments and history of motor vehicle collision involvement of older drivers. *Journal of American Geriatric Society*, 61, 252–257.
22. McGwin, G., Sims R. V., Pulley, L., & Roseman, J. M. (2000). Relations among chronic medical conditions, medications, and automobile crashes in the elderly: A population-based case-control study. *American Journal of Epidemiology*, 152, 424–431.
23. Petch, M. C. (1998). European Society of Cardiology Task Force Report: Driving and Heart

- Disease. *European Heart Journal*, 19(8), 1165–1177.
24. Binns, H., & Camm J. (2002). Driving and arrhythmias. *British Medical Journal*, 324, 927–928.
 25. Epstein, A. I., Miles, W. M., Benditt, D. G., Camm, A. J., Darling, E. J., Friedman, P.L., ... Wilkoff, B. L. (1996). Personal and public safety issues related to arrhythmias that may affect consciousness: implications for regulation and physician recommendations. *Circulation*, 94, 1147–1166.
 26. Consensus Conference, Canadian Cardiovascular Society. (1992). Assessment of the cardiac patient for fitness to drive. (1992). *Can Journal of Cardiology*, 8, 406–412.
 27. Epstein, A. E., Baessler, C. A., Curtis, A. B., Estes, N. A. 3rd, Gersh, B. J., Grubb, B., Mitchell, L. B., American Heart Association, & Heart Rhythm Society. (2007). Addendum to “Personal and public safety issues related to arrhythmias that may affect consciousness: Implications for regulation and physician recommendations.” *Circulation*, 115, 1170–1176.
 28. Legh-Smith, J., Wade D. T., & Langton Hewer, R. L. (1986). Driving after stroke. *Journal of the Royal Society of Medicine*, 79, 200–203.
 29. Fisk, G. D., Owsley, C., & Vonne Pulley, L. (1997). Driving after stroke: driving exposure, advice, and evaluations. *Archives of Physical Medicine and Rehabilitation*, 78, 1338–1345.
 30. Poole, D., Chaudry, F., & Jay, W.M. (2008). Stroke and driving. *Topics in Stroke Rehabilitation*, 15, 37–41.
 31. Wilson, T., & Smith T. (1983). Driving after stroke. *International Rehabilitation Medicine*, 5(4), 170–177.
 32. Engrum, E. S., Lambert, E. W., & Scott, K. (1990). Criterion-related validity of the cognitive behavioral driver’s inventory: brain injured patients versus normal controls. *Cognitive Rehabilitation*, 8, 20–26.
 33. Lundberg, C., Caneman, G., Samuelson, S., Halamies-Blomqvist, L., & Almqvist, O. (2003). The assessment of fitness to drive after stroke: The nordic stroke driver screening assessment. *Scandinavian Journal of Psychology*, 44, 23–30.
 34. Nouri, F. M., & Lincoln, N. B. Predicting driving performance after stroke. (1993). *British Medical Journal*, 307, 482–483.
 35. Devos, H., Akinwuntan, A. E., Nieuwboer, A., Ringoot, I, Van Berghen, K., Tant, M., ... De Weerd, W. (2010). Effect of simulator training on fitness-to-drive after stroke: a 5 year follow-up of a randomized controlled trial. *Neurorehabilitation Neural Repair*, 24(9), 843–

850.

36. Kewman, D. G., Seigerman, C., Kintner, H., Chu, S., Henson, D., & Reeder, C. (1985). Simulation training of psychomotor skills: teaching the brain-injured to drive. *Rehabilitation Psychology, 30*(1), 11–27.
37. Lundqvist, A., Gerdle, B., & Ronnberg J. (2000). Neuropsychological aspects of driving after a stroke— the simulator and on the road. *Applied Cognitive Psychology, 14*(2), 135–150.
38. Kapoor, W. N. (2002). Current evaluations and management of syncope. *Circulation, 106*, 1606–1609.
39. Sakaguchi, S., & Li, H. (2013). Syncope and driving, flying and vocational concerns. *Progress in Cardiovascular Diseases, 55*, 454–463.
40. Sorajja, D., Nesbitt, G. C., Hodge, D. O., Low, P. A., Hammill, S. C., Gersh, B. J., & Shen, W-K. (2009). Syncope while driving: clinical characteristics, causes, and prognosis. *Circulation, 120*, 928-934.
41. Epstein, A. E., Miles, W. M., Benditt, D. G., Camm, A. J., Darling, E. J., Friedman, P. L., ... Wilkoff, B. L. (1996, September 1). Personal and Public Safety Issues Related to Arrhythmias That May Affect Consciousness: Implications for Regulation and Physician Recommendations (Part 3 of 4). *Circulation, 94*(5):1147-66.
42. Dobbs, B., Carr, D. B., & Morris, J. C. (2002). Management and assessment of the demented driver. *Neurologist, 8*, 61–70.
43. Brown, L. B., & Ott, B. R. (2004). Driving and dementia: a review of the literature. *Journal of Geriatric Psychiatry and Neurology, 17*, 232–240.
44. Carr, D. B., & Ott, B. R. (2010). The older adult driver with cognitive impairment: “It’s a very frustrating life.” *Journal of the American Medical Association, 303*, 1632–1641.
45. Iverson D.J., Gronseth, G. S., Reger, M. A., Classen, S., Dubinsky, R. M, & Rizzo, M. (2010). Practice parameter update: evaluation and management of driving risk in dementia. (Report of the quality standards subcommittee of the American Academy of Neurology). *Neurology, 74*, 1316–1324.
46. Hunt, L., Murphy, C., Carr, D., Duchek, J. M., Buckles, V., & Morris, J.C. (1997). The reliability of the Washington University Road Test. *Archives of Neurology, 54*, 707–712.
47. Duchek, J. M., Carr, D. B., Hunt, L., Roe, C. M., Xiong, C., Shah, K., & Morris, J. C. (2003). Longitudinal driving performance in early stage dementia of the Alzheimer type. *Journal of the American Geriatrics Society, 51*, 1342–1347.

48. Ott, B. R., Heindel, W. C., Papandonatos, G. D., Festa, E. K., Davis, J. D., Daiello, L. A., & Morris, J. C. (2008). A longitudinal study of drivers with Alzheimer's disease. *Neurology*, 70, 1171–1178.
49. Ott, B. R., Anthony, D., Papandonatos, G. D., D'Abreu, A., Burock, J., Curtin, A., ... Morris, J. C. (2005). Clinician assessment of the driving competence of patients with dementia. *Journal of the American Geriatrics Society*, 53(5), 829–833.
50. Grace, J., Amick, M. M., D'Abreu, A., Festa, E. K., Heindel, W. C., & Ott, B. R. (2005). Neuropsychological deficits associated with driving performance in Parkinson's and Alzheimer's disease. *Journal of the International Neuropsychology Society*, 11(6), 766–775.
51. Brown, L. B., Stern, R. A., Cahn-Weiner, D. A., Rogers, B., Messer, M. A., Lannon, M. C., ... Ott, B. R. (2005). Driving scenes test of the Neuropsychological Assessment Battery and on-road driving performance in aging and very mild dementia. *Archives of Clinical Neuropsychology*, 20, 209–221.
52. Meuser, T. M., Carr, D. B., Berg-Weger, M., Niewoehner, P., & Morris, J. C. (2006). Driving and dementia in older adults: implementation and evaluation of a continuing education project. *Gerontologist*, 46, 680–687.
53. Valcour, V. G., Masaki, K. H., Curb, J. D., & Blanchette, P. L. (2000). The detection of dementia in the primary care setting. *Archives of Internal Medicine*, 160, 2964–2968.
54. Carr, D. B., Duchek, J., & Morris, J. C. (2000). Characteristics of motor vehicle crashes with dementia of the Alzheimer type. *Journal of the American Geriatrics Society*, 48(1), 18–22.
55. Stressel, D., Hegberg, A., & Dickerson, A. E. (2014). Driving for adults with acquired physical disabilities. *Occupational Therapy Health Care*, 28(2), 148–153.
56. Crizzle, A. M., Classen, S., & Uc, E. Y. (2012). Parkinson disease and driving: An evidence-based review. *Neurology*, 79, 2067–2074.
57. Classen, S. (2014). Consensus statements on driving with people with Parkinson's disease. *Occupational Therapy Health Care*, 28(2), 140–147.
58. American Academy of Neurology, American Epilepsy Society, and Epilepsy Foundation of America. (1994). Consensus statements, sample statutory provisions, and model regulations regarding driver licensing and epilepsy. *Epilepsia*, 35(3), 696–705.
59. Dratzkowski, J. F., Fisher, R. S., Sirven, J. I., Demaerschalk, B. M., Uber-Zak, L., Hentz, J.

- G., & Labiner, D. (2003). Seizure-related motor vehicle crashes in Arizona before and after reducing the driving restriction from 12 to 3 months. *Mayo Clinic Proceedings*, 78, 819–825.
60. Johns, M. W. (1991). A new method for measuring daytime sleepiness: the Epworth Sleepiness Scale. *Sleep*, 14, 540–545.
 61. Council on Aging. (1995). Position Statement on the Role of Psychiatrists in Assessing Driving Ability. *American Journal Psychiatry*, 152(5), 819.
 62. Barkley, R. A., & Cox, D. (2007). A review of driving risks and impairments associated with attention-deficit/hyperactivity disorder and the effects of stimulant medication on driving performance. *Journal of Safety Research*, 38(1), 113–128.
 63. Weinger, I., Kinsley, B. T., Levy, C. J., Bajaj, M., Simonson, D. C., Cox, D. J., ... Jacobson, A. M. (1999). The perception of safe driving ability during hypoglycemia in patients with type I diabetes. *American Journal of Medicine*, 107, 246–253.
 64. Cox, D. J., Gonder-Frederick, L. A., Kovatchev, B. P., Julian, D. M., & Clarke, W. L. (2000). Progressive hypoglycemia's impact on driving simulation performance: occurrence, awareness, and correction. *Diabetes Care*, 23, 163–170.
 65. American Diabetes Association. (2012). Diabetes and driving. *Diabetes Care*, 35 (Supp1), S81–S86.
 66. Jones, J. G., McCann, J., & Lassere, M. N. (1991). Driving and arthritis. *British Journal of Rheumatology*, 30, 361–364.
 67. Hu, P. S., Trumble, D. A., Foley, D. J., Eberhard, J. W., & Wallace, R. B. (1998). Crash risks of older drivers: a panel data analysis. *Accident Analysis & Prevention*, 30, 569–581.
 68. Sims, R. V., McGwin, G., Allman, R. M., Ball, K., & Owsley, C. (2000). Exploratory study of incident vehicle crashes among older drivers. *Journal of Gerontology, Series A: Biological Sciences and Medical Sciences*, 55, M22–M27.
 69. Marottoli, R. A., Wagner, D. R., Cooney, L. M., Doucette, J., & Tinetti, M. E. (1994). Predictors of crashes and moving violations among elderly drivers. *Annals of Internal Medicine*, 121, 842–846.
 70. Kent, R., Funk, J., & Crandall, J. (2003). How future trends in societal aging, air bag availability, seat belt use, and fleet composition will affect serious injury risk and occurrence in the United States. *Traffic Injury Prevention*, 4, 24–32.
 71. Sims, R. V., McGwin, G., Pulley, L., & Roseman, J. M. (2001). Mobility impairments in crash-involved drivers. *Journal of Aging Health*, 12, 430.

72. Vernon, D.D., Diller, E. M., Cook, L. J., Reading, J. C., Suruda, A. J., & Dean, J. M. (2002). Evaluating the crash and citations rates of Utah drivers licensed with medical conditions, 1992–1996. *Accident Analysis & Prevention*, 34, 237–246.
73. Vingilis, E., & Wilk, P. (2012). Medical conditions, medication use, and their relationship with subsequent motor vehicle injuries: Examination of the Canadian National Population Health Survey. *Traffic Injury Prevention*, 13, 327–336.
74. Koepsell, T., Wolf, M. M., & McCloskey, L. (1994). Medical conditions and motor vehicle collision injuries in older adults. *Journal of the American Geriatrics Society*, 42, 695–700.
75. Henriskson, P. (2001). Drivers with disabilities: A survey of adapted cars, driving habits and safety. (VTI report 466). Linköping, Sweden: Swedish National Road and Transport Research Institute.
76. Marottoli R.A., Allore, H., Araujo, K. L B., Iannone, L. P., Acampora, D., Gottschalk, M., ... Peduzzi, P. (2007). A randomized trial of a physical conditioning program to enhance the driving performance of older persons. *Journal of General Internal Medicine*, 22, 590–597.
77. Bédard, M., Guyatt, G. H., Stones, M. J., & Hirdes, J. P. (2002). The independent contribution of driver, crash, and vehicle characteristics to driver fatalities. *Accident Analysis & Prevention*, 34, 717–727.
78. Massie, D. L., & Campbell, K. L. (1993). Analysis of accident rates by age, gender, and time of day based on the 1990 Nationwide Personal Transportation Survey (Report No. UMTRI-93-7). Ann Arbor, MI: University of Michigan Transportation Research Institute.
79. Li, G., Braver, E. R., & Chen, L. H. (2003). Fragility versus excessive crash involvement as determinants of high death rates per vehicle mile of travel among older drivers. *Accident Analysis & Prevention*, 35, 227–235.
80. Stutts, J., Martell, C., & Staplin, L. (2009). Identifying Behaviors and Situations Associated with Increased Crash Risk for Older Drivers (Report No. DOT HS 811 093). Washington, DC: National Highway Traffic Safety Administration. Available at www.nhtsa.gov/DOT/-NHTSA/Traffic%20Injury%20Control/Articles/Associated%20Files/811093.pdf
81. Gotlin, R. S., Sherman, A. L., Sierra, N., Kelly, M. A., Pappas, Z., & Scott, W. N. (2000). Measurement of brake response time after right anterior cruciate ligament reconstruction. *Archives of Physical and Medical Rehabilitation*, 81(2), 201–204.
82. MacDonald, W., & Owen, J. W. (1988). The effect of total hip replacement on driving reactions. *Journal of Bone Joint Surgery*, 70B(2), 202–205.

83. Liebensteiner, M. C., Kern, M., Haid, C., Kobel, C., Niederseer, D., & Krismer, M. (2010). Brake response time before and after total knee arthroplasty: A prospective cohort study. *BMC Musculoskeletal Disorders*, 11, 267.
84. Dalury, D. F., Tucker, K. K., & Kelley, T. C. (2011). When can I drive? Brake response times after contemporary total knee arthroplasty. *Clinical Orthopaedics and Related Research*, 469, 82-86.
85. Marques, C. J., Barreiros, J., Cabri, J., Carita, A. I., Friesecke, C., & Loehr, J. F. (2008). Does the brake response time of the right leg change after left total knee arthroplasty? A prospective study. *Knee*, 15, 295–298.
86. Pierson, J. L., Earles, D. R., & Wood, K. (2003). Brake response time after total knee arthroplasty: When is it safe for patients to drive? *Journal of Arthroplasty*, 18(7), 840–843.
87. Marecek, G. S., & Schafer, M. F. (2013). Driving after orthopaedic surgery. *Journal of the American Academy of Orthopedic Surgery*, 21, 696–706.
88. Pierson, J. L., Ramsey, J., Clayton, R. T., & Stippich, K. T. (1999, February 7). TKA improves drivers' brake reaction time. Rosemont, IL: The American Academy of Orthopaedic Surgeons, Academy News.
89. Spalding, T. J., Kiss, J., Kyberd, P., Turner-Smith, A., Simpson, A.H. (1994). Driver reaction times after total knee replacement. *The Journal of Bone & Joint Surgery (British Volume) [now The Bone & Joint Journal]*, 76(5), 754–756.
90. Garharino, S., Nohili, L., Beelke, M., De Carli, F., & Ferrillo, F. (2001). The contributing role of sleepiness in highway vehicle accidents. *Sleep*, 24, 203–206.
91. Howard, M. E., Desal, A. V., Grunstein R. R., Hukins, C., Armstrong, J. G., Joffe, D., ... Pierce, R. J. (2004). Sleepiness, sleep-disordered breathing and accident risk factors in commercial vehicle drivers. *American Journal of Respiratory and Critical Care Medicine*, 170, 1014–1021.
92. Teran-Santos, J., Jimenez-Gomez, A., Cordero-Guevara, J., and the Cooperative Group Burgos-Santander. (1999). The association between sleep apnea and the risk of traffic accidents. *New England Journal of Medicine*, 340(11), 847–851.
93. Mulgrew, A. T., Nasvadi, G., Butt, A., Cheema, R., Fox, N., Fleetham, J. A., & Ayas, N. T. (2008). Risk and severity of motor vehicle crashes in patients with obstructive sleep apnoea/hypopnea. *Thorax*, 63, 536–541.
94. George, C. F. (2001). Reduction in motor vehicle collisions following treatment of sleep apnea with nasal CPAP. *Thorax*, 56(7), 508–512.

95. Vaz Fragoso, C.A., Araujo, K. L., Van Ness, P.H., & Marottoli, R. A. (2008). Prevalence of sleep disturbances in a cohort of older drivers. *Journal of Gerontol Series A: Biological Sciences and Medical Sciences*, 63, 715–723.
96. Hayashino, Y., Yamazaki, S., Nakayama, T., Sokejima, S, & Fukuhara, S. (2008). Relationship between diabetes mellitus and excessive sleepiness during driving. *Experimental and Clinical Endocrinology & Diabetes*, 116, 1–5.
97. Vaz Fragoso, C. A., Araujo, K., Van Ness, P., & Marottoli, R. A. (2010). Sleep disturbances and adverse driving events in a predominantly male cohort of active older drivers. *Journal of the American Geriatric Society*, 58, 1878–1884.
98. Rosenbloom, S., & Santos R. (2014, April). Understanding older drivers: an examination of medical conditions, medication use and travel behavior. Washington, DC: AAA Foundation for Traffic Safety. Available at www.aaafoundation.org/understanding-older-drivers-examination-medical-conditions-medication-use-and-travel-behavior.
99. Hetland, A., & Carr, D. B. (2014). Medications and impaired driving. *Annals of Pharmacother.*, 48, 494–506.
100. Dassanayake, T. (2011). Effects of benzodiazepines, antidepressants and opioids on driving: A systematic review and meta-analysis of epidemiological and experimental evidence. *Drug Safety*, 34, 125–156.
101. Bramness, J. G., Skurtvelt, S., Neutel, C. L., Mørland, J, & Engeland, A. (2008). Minor increase in traffic accidents after prescriptions of antidepressants: a study of population registry data in Norway. *Journal of Clinical Psychiatry*, 69, 1099–1103.
102. Qato D. M., Alexander, G., C., Conti R. M., Johnson, M., Schumm, P., & Lindau, S. T. (2008). Use of prescription and over-the-counter medications and dietary supplements among older adults in the United States. *Journal of the American Medical Association*, 300(24), 2867.
103. LeRoy, A. A., & Morse, M. L. (2008, May). Multiple medications and vehicle crashes: Analysis of databases (Report No. DOT HS 810 858). Washington, DC: National Highway Traffic Safety Administration. Available at www.nhtsa.gov%2FDOT%2FNHTSA%2FTraffic%2520Injury%2520Control%2FArticles%2FAssociated%2520Files%2F810858.pdf
104. Weiler, J. M., Bloomfield, J. R., Woodworth, G. G., Grant, A. R., Layton, T. A., Brown, T. L., ... Watson, G. S. (2000). Effects of fexofenadine, diphenhydramine, and alcohol on driving performance. a randomized placebo-controlled trial in the Iowa Driving Simulator. *Annals of Internal Medicine*, 132(5), 354–363.

105. Tashiro, M., Horikawa, E., Mochizuki, H., Sakurada, Y., Kato, M., Inokuchi, T., ... Yanai, K. (2005). Effects of fexofenadine and hydroxyzine on brake reaction time during car driving with cellular phone use. *Human Psychopharmacology*, 20, 501–509.
106. Mattila, M. (1988). Acute and subacute effects of diazepam on human performance: Comparison of plain tablet and controlled release capsule. *Pharmacological Toxicology*, 63(5), 369–374.
107. Aranko, K., Mattila, M. J., & Bordinon, D. (1985). Psychomotor effects of alprazolam and diazepam during acute and subacute treatment, and during the follow-up phase. *Acta Pharmacologica Toxicologica*, 56(5), 364–372.
108. American Geriatrics Society 2015 Beers Criteria Update Expert Panel (2015, November). American Geriatrics Society 2015 updated Beers Criteria for potentially inappropriate medication use in older adults. *Journal of the American Geriatrics Society*, 63(11), 2227–46.
109. Avorn, J., Schneeweiss, S., Sudarsky, L. R., Benner, J., Kiyota, Y., Levin, R., & Glynn, R. J. (2005). Sudden uncontrollable somnolence and medication use in Parkinson disease. *Archives of Neurology*, 62(8), 1242–1248.
110. Hobson, D. E., Lang, A. E., Martin, W. R., Razmy, A., Rivest, J., & Fleming, J. (2002). Excessive daytime sleepiness and sudden-onset sleep in Parkinson disease: A survey by the Canadian Movement Disorders Group. *Journal of the American Medical Association*, 287(4), 455–463.
111. Hansen, R. N., Boudreau, D. M., Ebel, B. E., Grossman, D. C., & Sullivan, S. D. (2015). Sedative hypnotic medication use and the risk of motor vehicle crash. *American Journal of Public Health*, 105, e64–e69.

CHAPTER 10 MEETING FUTURE TRANSPORTATION NEEDS OF OLDER ADULTS

Key Points

- A holistic approach that incorporates assessment and intervention and that facilitates the transition to driving limitation or cessation when necessary is encouraged.
- A tiered assessment strategy offers potential advantages for gauging risk in clinical offices and licensing agencies, although more evidence is needed regarding content, efficiency, and effectiveness.
- Clinicians should be aware of and use driving evaluation resources in their area, including driving rehabilitation specialists (DRSs).
- As new technologies are developed, their role in enhancing safety of older adult drivers, passengers, and pedestrians should be assessed.
- Clinician involvement and communication with driver licensing agencies should be encouraged and facilitated.
- Coordination among clinicians, licensing agencies, and relevant State/local/community agencies/organizations is encouraged to help older adults and their caregivers become aware of transportation resources in their community and how to access these resources.

The previous chapters provide the clinical team with recommendations and tools for enhancing the driving safety of older adults. As in other aspects of patient care, however, further research can lead to more effective care. Further progress on the following would be beneficial:

- In-office tools that can predict crash risk or determine fitness to drive
- Improved access to driver assessment and rehabilitation
- Advanced technology in vehicles to assist drivers with navigation and safety issues
- Safer roads
- Better transportation alternatives
- Increased crashworthiness of vehicles
- Other vehicular improvements that can help keep older adult drivers safe on the road as long as possible
- Intervention trials to lower risk, maintain driving life expectancy and/or improve driving

To accomplish these objectives, coordinated efforts among the health care and transportation communities, policymakers, community planners, the automobile industry, and government agencies are needed to achieve the common goal of safe transportation for the older population. As this population continues to expand and live longer, the challenge is to keep pace with its transportation needs. Although many transportation alternatives are beginning to develop (e.g., fully automated vehicles, golf cart communities, private car rideshare programs), review of the use of these by older adults is beyond the scope of this chapter.

This chapter discusses the research, initiatives, applications, and system changes deemed essential for improving driving safety of older adults. Readers are also encouraged to review the National Highway Traffic Safety Administration's *Traffic Safety for Older People – 5-Year Plan* to address traffic concerns of older adults for additional ideas.¹

Improved Clinician Tools for Assessment of Driving Safety

Clinicians need an assessment approach that reliably identifies older adult drivers at increased risk of a car crash. A tiered assessment strategy can be considered for clinical settings in which older adult drivers are screened routinely (on the basis of certain risk criteria) or if concerns about their driving arise (a similar strategy for licensing agencies is discussed below). Depending on test results, the driver would be scheduled for more detailed assessment or an on-road driving evaluation. Fully implementing such a strategy in different clinical settings would involve logistical challenges. The ideal tests would assess the primary functions related to driving and form the basis for interventions to correct or ameliorate any identified conditions or functional deficits. In addition, this tool should be brief, inexpensive, easy to administer, and validated to predict crash risk and/or ability to pass a performance-based, standardized, reliable and valid road test.

At present, no one comprehensive tool is available, in part because of the multifactorial nature of driving ability and because of the limitations of potential measures. Global cognitive measures are easy to administer and score but may not adequately address the cognitive abilities necessary for safe driving. One such measure, the Mini-Mental State Examination, was not associated with crash involvement in a recent large multisite study.² Despite the large sample size, participants were relatively young and there was limited adjustment for driving exposure. The limited ability of global cognitive measures to predict adverse driving events has increasingly led to a focus on other measures that address relevant cognitive domains such as executive function, attention, information processing speed, or visuospatial ability. One such measure, the Trail-Making Test Part B, has shown potential in predicting adverse driving events.³ However, findings have been mixed, and the Trail-Making Test has its limitations as well.⁴ Part of the difficulty is studying heterogeneous groups of drivers who may have very different risk factors. One approach is to narrow testing to individuals with a specific disorder or particular disease (e.g., glaucoma, dementia); however, this will obviously not be broadly applicable.

Clinical teams desire a quick, cost-effective, widely available comprehensive tool to determine driving recommendations. Until such a tool is available, given the multiple complexities of driving, the clinical team may be better served by tailoring assessment and intervention to the particular strengths and limitations of each older adult driver. Clinicians can evaluate older adults' potential driver risk by assessing functions related to driving (see Chapter 3) and reviewing the presence and/or severity of important medical conditions, functional deficits, and use of potentially driver-impairing medications (see Chapter 9). Given the projected increase in

prevalence of dementia, clinicians should also try to ascertain caregiver concerns and factor these into the assessment and intervention process.⁵

Increased Availability and Affordability of Driver Rehabilitation Services

When the results of clinician assessment are unclear, or when further correction of functional deficits through clinical team management is not possible, DRSs are an excellent resource. DRSs can perform a focused clinical assessment, observe the older adult during the actual driving task, and train him or her in the use of adaptive techniques or devices to compensate for medical conditions or functional deficits (see Chapter 5).

Unfortunately, access and cost remain major barriers to use of DRSs by older drivers and referring clinicians. DRSs are not available in all communities, and there are presently too few to provide services to all older drivers in need. Furthermore, driver assessment and rehabilitation are expensive, and Medicare and private insurance companies rarely pay for these services.

The American Occupational Therapy Association (AOTA) has tried to address these issues through a number of initiatives. AOTA has devised a framework to increase the number of DRSs within the occupational therapy (OT) profession, including strategies to promote older driver expertise among current OT practitioners, curriculum content for continuing education programs, and training modules for entry-level OT educational programs. AOTA also continues to actively lobby for consistent Medicare and insurance coverage of OT-performed driver assessment and rehabilitation, under the premise that these services fall within the scope of OT practice and that driving is an instrumental activity of daily living.

In the effort to keep older adult drivers on the road safely as long as is reasonable, increased access to and affordability of driver assessment and rehabilitation are essential. Clinicians need to be aware of DRS services and programs in their area and use these resources whenever possible. Further research in this field is encouraged to demonstrate the efficacy and cost-effectiveness of DRS services, and to create standardized off-road and on-road driving tests that have respectable levels of reliability, validity, and test stability. Correlating results of on-road tests with prospective at-fault crash data remains an important area of future study.

Increased Investigation Into Use of Simulators and Comprehensive Assessment Methods and Techniques

Validated driver assessment technologies may help make driver assessment more widely available to older drivers. Simulated driving assessments offer a number of potential advantages compared with on-road testing, including standardization of the driving environment and scenarios encountered during testing, time efficiency, and safety for testing high-risk individuals. However, a number of challenges exist, including potential trade-offs between fidelity/realism versus cost/complexity of systems, tolerability and motion sickness in

an older adult population, and complexity of scoring results. It remains to be seen whether simulator testing will remain an adjunct to the assessment process or can reliably substitute for on-road evaluations, particularly in a population less familiar with simulator use. It will be useful to determine if familiarity with computers and electronic games by successive aging cohorts affects the outcome of simulator performance and/or reduces crashes. As interventions develop, it will be useful to determine the role of simulator training in relation to classroom and on-road training.

Efforts should continue to better understand the complex role the central nervous system plays in operating a motor vehicle.^{6,7} As new technologies are developed to better delineate different disorders, it will be helpful to determine the role these can play in determining driver risk. State licensing agencies and driver rehabilitation programs are encouraged to investigate the use of technologies to increase availability of reliable driver assessment services to the public. Such technologies, if integrated into or aligned with current practices, could help form an intermediate step between clinician assessment and driver rehabilitation or increase the licensing agency's capacity to offer specialized driver assessment to at-risk drivers.

Enhanced Role of the State Licensing Agency in Promoting Safety of Older Drivers

As the agency that ultimately issues, renews, restricts, and revokes driver licenses, each State's driver licensing agency has the task of distinguishing unsafe drivers from safe drivers. Although each State has its own procedures, potentially unsafe drivers are usually identified by one of four means: failure of the individual to meet licensing or license renewal criteria; report from the individual or family; report from clinicians, DRSs, law enforcement officers, and others; and judicial report.

To meet the standards for licensing, the driver licensing agency initially requires individuals to pass assessments of knowledge, vision, and driving skills. License renewal tends to be less stringent, with many States permitting renewal by mail. In recent years, certain States have increased their efforts to identify drivers at risk of unsafe driving by stipulating special renewal procedures based on different criteria. These procedures include shortened renewal intervals, in-person renewal, and mandatory reassessment of knowledge, vision, or driving skills.

Numerous studies have examined safety confounders for older adult drivers and hypothesized about the most beneficial approach. A recent review of studies in this area summarized the evidence as suggesting that in-person renewal was associated with lower fatal crash risk, license restrictions were associated with decreased exposure, and more renewal requirements or medical reporting were linked with delicensure.⁸ Whether the latter findings are viewed as a positive outcome depends on individual perspective. If those targeted for restriction or more intense renewal requirements are truly at increased safety risk, then public safety may benefit. If not, those individuals' mobility may be adversely affected without clear gains in public safety.

This area warrants further investigation. States are encouraged to maintain or adopt renewal procedures for the most effective identification of at-risk drivers (see also Enhanced Role of the Medical Advisory Board, below). States are also encouraged to base their standards for licensing on current scientific data. For example, visual acuity standards based on outdated research may be unnecessarily restrictive to all drivers and to older adult drivers in particular.

In addition to the vision screens currently in use, driver licensing agencies may also wish to use newer tools (e.g., contrast sensitivity and the useful field-of-view test) that have been shown to correlate with crash risk.^{9,10} Some of these tools, along with other tests of function and driving skills, have been field tested by the California Department of Motor Vehicles as part of its three-tier assessment system. Although this approach has many conceptual advantages, as tested there were limitations in its effectiveness.^{11,12} Many lessons can be learned from this large-scale, practical experiment, and all jurisdictions would benefit from a better understanding of what worked well, what did not, and how to improve on the approach and implementation. In Maryland, a tiered approach is used to identify and assess medical fitness to drive in clients for whom decline in cognitive function is raised in materials submitted to the licensing agency. Most of the drivers in cohort are older adult drivers. A free, five-element screening test is routinely used to assess these individuals.^{13,14}

Driver licensing agencies could also create a more supportive system for older drivers. For example, the agency can work more closely with the at-risk driver's clinical team or the Medical Advisory Board to correct functional deficits through treatment, if possible. Drivers with a high potential for rehabilitation can be referred by the licensing agency to a DRS to learn adaptive techniques and devices. Licensing agencies can also consider the older adult's driving needs by issuing restricted (e.g., geographic or time of day) licenses whenever possible to help the driver maintain driving ability while protecting his or her safety. For older adult drivers who must relinquish their license, the agency can provide guidance in seeking alternative transportation and linkages to other agencies that might be helpful in identifying available resources.

At-risk drivers can also be brought to the attention of the driver licensing agency by clinician referral. However, many clinicians are not aware of their State's referral procedures,¹⁵ and others fear legal liability for breach of confidentiality. With the advent of the Health Insurance Portability and Accountability Act (HIPAA), clinicians may have questions about the extent and detail of patient information they should or can provide in a referral. Driver licensing agencies can encourage clinician referral by establishing clear guidelines and simple procedures for referral (e.g., comprehensive referral forms that can be accessed over the Internet) and promoting clinician awareness of these guidelines and referral procedures. A 2012 review critiqued the forms used by 52 jurisdictions in North America and made a number of recommendations on best practices.¹⁶ In many States, clinicians who refer older adults to their State's driver licensing agency are not granted legal protection against liability for breaching the patient's confidentiality. Indeed, several States encourage or require clinicians to report

impaired drivers without specifically offering this legal protection. Most statutes that do provide immunity for reporting in good faith apply only to physicians.

Clinicians should join advocacy groups in their States to pass fair laws that protect clinicians who report in good faith and that ensure anonymity for reporting. Statutes providing immunity should include all members of the clinical team who are involved in the care and evaluation of drivers for whom there are concerns about medical fitness to drive (e.g., physicians, nurse practitioners, physician assistants, driver rehabilitation specialists, social workers, pharmacists, occupational therapists, nurses, etc.). State legislatures are encouraged to establish or maintain good-faith reporting laws that provide immunity from breach of confidentiality lawsuits for clinicians and others who report potentially impaired drivers to their State licensing authority.

The State licensing agency should be involved in outreach education to clinicians, law enforcement, drivers and their caregivers to improve awareness of their obligations regarding the reporting of medical conditions to the agency, which could promote earlier interventions. A website with easily accessible information and resources is essential. Ideally, the medical review unit staff and/or members of the medical advisory board should be available for outreach efforts and should partner with appropriate agencies and groups (e.g., departments on aging, health care professional societies, etc.) to facilitate outreach education.

Future older adult drivers will present with increasingly complex driving ability questions. For instance, palliative care providers may be confronted with an older adult's determination to continue driving past the time of medical fitness to drive. Such cases will challenge medical understanding, ethics, and legal counsel.¹⁷ Health care teams and licensing agencies should anticipate preparing for diverse driving capacity scenarios in the years to come.

Enhanced Role of the Medical Advisory Board

A Medical Advisory Board (MAB) is generally composed of State-licensed clinicians who work in conjunction with the driver licensing agency to determine whether mental or physical conditions may impair an individual's ability to drive safely. MABs vary among States in size, role, and level of involvement. For example, the MAB of the Maryland Motor Vehicle Administration reviews the fitness of individuals to drive safely, while California's MAB provides recommendations to licensing agency staff for use in developing policies that affect medically and functionally impaired drivers.¹⁸ Many States lack an MAB or have one that is suboptimally used.

Each State driver licensing agency is encouraged to enhance the role of its MAB to provide improved capacity for assessment, rehabilitation, and support to older adult drivers. States that lack MABs are also encouraged to create a multidisciplinary team of medical experts to develop and implement recommendations on the medical fitness of their State's licensed drivers. Such recommendations should be based on the most current scientific data and implemented in an efficient review process.

The National Highway and Traffic Safety Administration and the American Association of Motor Vehicle Administrators completed a study of each State's MAB practices.¹⁹ This project detailed the function of each State's MAB; its regulatory guidelines; and barriers to implementation of screening, counseling, and referral activities. The executive summary of this study had many important recommendations for States that license medically impaired drivers, including:

- Each State should have an active board to set standards and guidelines and to be involved in fitness-to-drive evaluations.
- Board members should be adequately compensated.
- Clinicians should be granted immunity for reporting.
- National standards and forms, and referrals for mobility counseling and/or DRSS, should be considered.

Increased Public Awareness of Medication Adverse Effects that May Impair Driving

Many prescription and over-the-counter medications have the potential to impair driver performance. Despite warnings on the label and counseling by clinicians, many older adults and their caregivers are unaware of these risks.

To address this problem, the National Transportation Safety Board (NTSB) has recommended²⁰ that the U.S. Food and Drug Administration (FDA) establish a clear, consistent, and easily recognizable warning label for all prescription and over-the-counter medications that may interfere with ability to operate a vehicle. This recommendation was the focus of an FDA/NTSB joint public meeting held in November 2001. This meeting hosted presentations of epidemiologic and controlled data on the effects of sedating drugs and crash risk, as well as presentations from innovators of devices designed to test the degree to which drugs may impair driving. As a result of the meeting, the FDA and NTSB concluded that steps must be taken to better educate the public and prescribing clinicians on adverse effects of potentially driver-impairing medications. Efforts to increase older adult driver, caregiver, and clinician education and to clarify labeling for consumers are encouraged.

Currently, manufacturers of medications do not routinely test their products for effects on driving, nor are they required to do so. The identification and routine use of effective testing parameters to identify medications that may interfere with the ability to safely operate a motor vehicle is encouraged. Similarly, such parameters could be used to identify medications that do not typically impair drivers when used as directed.

Promotion of Self-Awareness and Appropriate Self-Regulation

Generally, older adult drivers modify their driving routine by self-regulation. Some drivers participate in educational programs or occupational therapy interventions in an effort to

decrease crash risk by increasing their awareness of questionable driving habits and learning adaptive strategies. Occupational therapy interventions assist older adult drivers to develop objectivity in themselves and their driving environment.²¹ In late life, both women and men do compensate for individual changes in their health and capacity to drive, but a recent study found that older women were somewhat more likely than older men to stop or limit driving over time and that the factors associated with these changes differed by gender.²²

Vehicle Designs that Optimize Safety of Older Adult Drivers and Passengers

Age-related changes in vision, cognition, and motor ability may affect an individual's ability to enter/exit a motor vehicle with ease, assess critical driving information, and handle a motor vehicle safely. Older adults are also less able to endure and recover from injuries sustained in an automobile crash. Vehicle manufacturers are encouraged to explore and implement enhancements in vehicle design that address and compensate for these physiologic changes.

In particular, vehicle designs based on the anthropometric parameters of older adults (i.e., physical dimensions, strength, fragility, and range of motion) may be optimal for entry/exit; seating safety and comfort; seat belt/restraint systems; and placement and configuration of displays, mirrors and controls. Improvements in headlamp lighting to enhance nighttime visibility and reduce glare, as well as the use of high-contrast legible fonts and symbols for in-vehicle displays, may help compensate for age-related changes in vision.²³ In addition, prominent analog gauges may be easier to see and interpret than small digital devices.²⁴ Computers have revolutionized the motor vehicle industry by managing airbag safety systems, antilock brakes, and global positioning systems. In-vehicle tools to assess for high-risk conditions may be developed in the future.

In the event of a crash, improved crashworthy vehicle designs and restraint systems designed for fragile occupants may enhance the safety of older adult drivers and passengers. Certain add-on features may also make current vehicle designs safer and more accessible for older adult drivers. For example, handholds and supports on door frames may facilitate entry/exit for both drivers and passengers. Padded steering wheels and seat adjuster handles (rather than knobs) may benefit drivers with decreased hand grip, and adjustable steering wheels and foot pedals may aid drivers with limited range of motion or of smaller stature.²⁵

Crashes involving older adult drivers and fatality rates have fallen in recent years, despite the increased fragility of older adults. It may be possible to enhance these gains by better understanding the factors that enter into older drivers' vehicle selection and incorporating the issues outlined above into this process.²⁶ A initial effort to promote the selection of vehicles that may be a better fit for older adults is in place at the American Automobile Association website.²⁷ Other adjustable controls and displays may allow older drivers to tailor their vehicle to their changing abilities and needs. Safety features that may benefit

older adults include smart headlights, emergency response systems, reverse monitoring, blind spot/lane departure warning, stability control, assisted parking, voice-activated controls, crash mitigation systems, and drowsy driver alerts.²⁸ Electronic stability control is now standard equipment on all new vehicles and may lead to further safety gains as it becomes more prevalent in the vehicle fleet.²⁹

Optimal Environments for Older Adult Drivers and Pedestrians

To promote aging in place, clinical teams are encouraged to be realistic regarding environmental features essential for older adults. A recent review noted that older adults prioritized safety considerations when making mobility choices. Additional desirable elements included aesthetics (clean surroundings), land use (commercial/residential availability), format of street networks, and the older adult's cognitive and physical abilities to utilize these characteristics of their environment.³⁰

Many older adult drivers are at a disadvantage on roads and highways that are most heavily used by and traditionally designed for a younger population. In a telephone survey of 2,422 people 50 and older, nearly one of five participants considered inconsiderate drivers to be a major problem. Other commonly identified problems included traffic congestion, crime, and fast traffic.³¹

These problems may be ameliorated through traffic law enforcement and better road and traffic control designs. One of the top requests of the nearly 200 Iowans (older drivers, transportation professionals, and senior-related professionals) attending the Iowa Older Drivers Forum was the enhanced enforcement of speed and aggressive driving laws.³² In terms of road and traffic engineering, the Federal Highway Administration has recognized and addressed the needs of older adult drivers in its Handbook for *Designing Roadways for the Aging Population*, a supplement to existing standards and guidelines in the areas of highway geometry, operations, and traffic control devices.³³ These design features may be implemented in new construction, renovation and maintenance of existing structures, and "spot" treatment at certain locations where safety problems exist or are anticipated.²⁷ The Federal Highway Administration handbook is updated periodically to incorporate the latest research on the effectiveness of design and engineering enhancement to accommodate older adult drivers.

Better Alternatives to Driving

Alternatives to driving are often less than ideal or nonexistent. When faced with the choice of unsafe driving or losing mobility, many older adults risk their safety by continuing to drive.

Existing forms of transportation clearly need to be optimized for use by older adults. In a telephone survey of 2,422 people 50 and older, ride-sharing was the second most common mode of transportation (after driving); however, nearly a quarter of the survey participants cited feelings of dependency and concerns about imposing as a barrier to use. Public

transportation was the usual mode of transportation for fewer than 5% of survey participants, with many citing unavailable destinations, problems with accessibility, and fear of crime as barriers to use. Fewer than 5% used taxis as their usual mode of transportation because of the high cost.³¹

Until these barriers are addressed, these forms of transportation will remain suboptimal for many older adults.

Transportation programs created specifically for the older population, such as senior shuttles and vans, exist in certain communities. A number of locations have adopted the independent transportation network model.³⁴ These programs address the Five A's of Senior-Friendly Transportation: availability, accessibility, acceptability, affordability, and adaptability (see below).³⁵ As the older population continues to grow in numbers, the creation of new programs or expansion of existing ones is encouraged to keep pace with passengers' needs, as well as stronger community outreach to increase awareness of such programs.

The Five A's of Senior-Friendly Transportation*

- Availability: Transportation exists and is available when needed (e.g., evenings, weekdays, weekends).
- Accessibility: Transportation can be reached and used (e.g., bus stairs are negotiable, seats are high enough, vehicle comes to the door, transit stops are reachable).
- Acceptability: Deals with standards, including cleanliness and safety (e.g., the transporting vehicle is clean, transit stops are in safe areas, drivers are courteous and helpful).
- Affordability: Deals with costs (e.g., fees are affordable, vouchers or coupons are available to defray out-of-pocket expenses).
- Adaptability: Transportation can be modified or adjusted to meet special needs (e.g., the vehicle can accommodate a wheelchair, trip chaining is possible, escorts can be provided).

* Source: *Supplemental Transportation Programs for Seniors*, The Beverly Foundation.

The occupational therapy discipline has been at the forefront of driving and community mobility issues. Its work reminds the clinical team to maintain a client-centered approach when counseling older adult drivers and to avoid the one-size-fits-all perspective. Most clinical team members and especially occupational therapists agree that often no single element of physical and cognitive capacity is sufficient to require driving cessation, but rather a multidimensional approach is necessary.³⁶ The number of different fitness-to-drive assessment tools and simulator evaluation techniques reflect the heterogeneity of the older adults these strategies are designed to assess.

To address these issues, the roles and responsibilities of all parties involved in the process need to be better defined, delineated, and disseminated. Drivers, caregivers, clinicians, DRSs, other health professionals, licensing authorities, and other community/State/national agencies and organizations have a role to play. Society as a whole needs to be involved in a discussion of acceptable thresholds of risk. In the process of identifying drivers potentially at increased risk of driving safety difficulties, a fair and appropriate assessment of risk is needed, identifying factors potentially influencing risk, considering interventions to lower risk, and identifying ways to facilitate the transition to driving limitations or cessation if drivers prefer to do so or if interventions are not possible or successful. More communication and coordination among the parties involved is needed, as well as demonstrating the effectiveness of different steps in the process, and more information on feasibility and sustainability. A holistic approach to the process is needed that considers not just driving, but mobility in a broad sense.³⁷ An ideal system would also consider competing risks (e.g., falls, pedestrian safety) and interventions that might benefit these as well.

Evidence emerging in the last 10–15 years has allowed a realistic consideration of expanding from a decision regarding driving versus not driving, or licensing versus revocation of licensing, to a discussion that includes interventions. Interventions have been developed that enhance relevant functional abilities, driver awareness of deficits, clinician and caregiver awareness of how to address the issue, and facilitating the transition to driving cessation.³⁸⁻⁴⁷ Many of these studies have been preliminary or small scale, and much more information is needed on how to broaden their applicability and to determine the ancillary effects if they are applied more broadly.

Although these and other questions need to be answered, the good news is that much more preliminary information is available now than at any time in the past. Consequently, it is realistic to think holistically of a more comprehensive and integrated approach to driving safety and mobility that better balances individual autonomy, mobility, and safety with public health and safety. This holistic approach reflects many current national, State, and local efforts that more broadly consider the interrelationship and integration of transportation, health, housing, and environmental factors. Examples of such initiatives include the Interagency Partnership for Sustainable Communities by the Department of Transportation, the Environmental Protection Agency, and Housing and Urban Development. A number of other initiatives with similar or overlapping themes such as Aging in Place, Complete Streets, and Livable Communities have been advocated and investigated by AARP, the Centers for Disease Control, and the American Public Health Association, among others. Other initiatives, such as the Ride to Wellness Program, directly address the link between transportation and health factors. Programs such as these are to be encouraged and studied, with the goal of enhancing and optimizing their effectiveness, efficiency, and sustainability.

References

1. National Highway Traffic Safety Administration. (2013, December). *Traffic safety for older people — 5-year plan* (Report No. DOT HS 811 837). Washington, DC: Author. Available at www.nhtsa.gov/staticfiles/nti/older_drivers/pdf/Older_People_811873.pdf
2. Joseph, P.G., O'Donnell, M. J., Teo, K. K., Gao, P., Anderson, C., Probstfield, J. L., ... Yusuf, S. (2014). The Mini-Mental State Examination, clinical factors, and motor vehicle crash risk. *Journal of the American Geriatric Society*, 62, 1419–1426.
3. Staplin, L., Gish, K., W., & Sifrit, K. J. (2014). Using cognitive status to predict crash risk: Blazing new trails? *Journal of Safety Research*, 48, 19–25.
4. Vaucher, P., Herzig, D., Cardoso, I., Herzog, M. H., Mangin, P., & Favrat, B. (2014). The trail making test as a screening instrument for driving performance in older drivers; a translational research. *BioMed Central Geriatrics*, 14, 123.
5. Meuser, T. M., Carr, D. B., Unger, E. A., Ulfarsson, G. F. (2015). Family reports of medically impaired drivers in Missouri: cognitive concerns and licensing outcomes. *Accident Analysis & Prevention*, 74, 17–23.
6. Walter, H., Vetter, S. C., Grothe, J., Wunderlich, A. P., Hahn, S., & Spitzer, M. (2001). The neural correlates of driving. *Neuroreport*, 12(8), 1763–1767.
7. Ott, B. R., Heindel W.C., Whelihan W. M., Caron, M.D., Piatt, A. L., & Noto, R. B. (2000). A single-photon emission computed tomography imaging study of driving impairment in patients with Alzheimer's disease. *Dementia and Geriatric Cognitive Disorders*, 11(3), 153–160.
8. Dugan, E., Vartan, K. N., Coyle, C., & Lee, C. M. (2013). U.S. policies to enhance older driver safety: a systematic review of the literature. *Journal of Aging & Social Policy*, 25, 335–352.
9. Owsley, C., Stalvey, B. T., Wells, J., Sloane, M. E., & McGwin, G. Jr. (2001). Visual risk factors for crash involvement in older drivers with cataracts. *Archives of Ophthalmology*, 119, 881–887.
10. Owsley, C., Ball, K., & McGwin, G. (1998). Visual processing impairment and risk of motor vehicle crash among older adults. *Journal of the American Medical Association*, 279, 1083–1088.
11. Hennessy, D. F., & Janke, M. K. (2009). Clearing a Road to Being Driving Fit by Better

Assessing Driving Wellness: Development of California's prospective three tier driving-centered assessment system. (Report No. RSS-OS-216). Sacramento: California Department of Motor Vehicles.

12. Camp, B. J. (2014). The overall program effects of California's 3-tier assessment system pilot on crashes and mobility among senior drivers. *Journal of Safety Research*, 47, 1–8.
13. Ball, K., Roenker, D. L., Wadley, V. G., Edwards, J. D., Roth, D. L., McGwin Jr, G., ... Dube T. (2006) Can high-risk older drivers be identified through performance-based measures in a department of motor vehicles setting. *Journal of American Geriatrics Society*, 54, 77-84.
14. Soderstrom, C. A., & Joyce, J. J. (2008). Medical Review of fitness to drive in older drivers: The Maryland experience. *Traffic Injury Prevention*, 9, 342-349.
15. Cable, G., Reisner, M., Gerges, S., & Thirumavalavan, V. (2000). Knowledge, attitudes, and practices of geriatricians regarding patients with dementia who are potentially dangerous automobile drivers: a national survey. *Journal of the American Geriatrics Society*, 48(1), 14–17.
16. Meuser, T. M., Berg-Weger, M., Niewoehner, P. M., Harmon, A. C., Kuenzie, J. C., Carr, D. B., & Barco, P. D. (2012). Physician input and licensing of at-risk drivers: A review of all-inclusive medical evaluation forms in the US and Canada. *Accident Analysis & Prevention*, 46, 8–17.
17. Gaertner, J., Vent, J., Greinwald, R., Rothschild, M. A., Ostgathe, C., Kessel, R., & Voltz, R. (2011). Denying a patient's final will: public safety vs. medical confidentiality and patient autonomy. *Journal of Pain Symptom Management*, 42, 961– 966.
18. Raleigh, R., & Janke, M. (2001). The role of the medical advisory board in DMVs: protecting the safety of older adult drivers. Maximizing Human Potential: Newsletter of the Network on Environments, Services and Technologies for Maximizing Independence. *American Society on Aging*, 9(2), 4–5.
19. Lococo, K. H, & Staplin, L. (2005, July). Strategies for medical advisory boards and licensing review (Report No. DOT HS 809 874). Washington, DC: National Highway Traffic Safety Administration. Available at www.nhtsa.gov/people/injury/research/MedicalAdvisory/-pages/Job%201602%20-%20final%20new.pdf

20. National Transportation Safety Board. (2000, January 13). Safety Recommendation I-00-5. Retrieved from the NTSB website at www.nts.gov/safety/safety-recs/recletters/I00_1_4.pdf
21. Golisz, K. (2014). Occupational therapy interventions to improve driving performance in older adults: a systematic review. *American Journal of Occupational Therapy*, 68, 662–669.
22. Dit Asse, L. M., Fabrigoule, C., Helmer, C., Laumon, B., & Lafont, S. (2014). Automobile driving in older adults: factors affecting driving restriction in men and women. *Journal of American Geriatric Society*, 62, 2071–2078.
23. Schieber, F. (1994). High-priority research and development needs for maintaining the safety and mobility of older drivers. *Experimental Aging Research*, 20, 35–43.
24. Koonce, J. M., Gold, M., & Moroze, M. (1986). Comparison of novice and experienced pilots using analog and digital flight displays. *Aviation and Space Environmental Medicine*, 57(12 pt. 1), 1181–1184.
25. Organization for Economic Co- Operation and Development. (2001). Ageing and Transport: Mobility Needs and Safety Issues. Paris: Author, pp 60, 69–71.
26. Cicchino J.B., & McCartt, A. T. (2014). Trends in older driver crash involvement rates and survivability in the United States: an update. *Accident Analysis & Prevention*, 72, 44–54.
27. AAA Senior Driving. (2015). Find the Right Vehicle for You (Web page, no longer available). Retrieved from the AAA website at: <http://seniordriving.aaa.com/maintain-mobility-independence/car-buying-maintenance-assistive-accessories/find-right-vehicle-you>.
28. The Hartford Financial Services Group, Inc. (2012). Top Technologies for Mature Drivers. Hartford, CT:, Author.
29. Ferguson, S. A. (2007). The effectiveness of electronic stability control in reducing real-world crashes: a literature review. *Traffic Injury Prevention*, 8, 329–338.
30. Yen, I. H., Flood J. F., Thompson, H., Anderson, L. A., & Wong, G. (2014). How design of places promotes or inhibits mobility of older adults: realist synthesis of 20 years of research. *Journal of Aging Health*, 26, 1340–1372.

31. Ritter, A. S., Straight, A., & Evans, E. (2002). Understanding Senior Transportation: Report and Analysis of a Survey of Consumers Age 50+. Washington, DC: American Association for Retired Persons.
32. Iowa Safety Management System: Safe Mobility Decisions for Older Drivers Forum. June 19–20, 2002,; Ames, IA. The Forum Outlined.
33. Brewer. M., Murillo, D., & Pate, A. (2014). Handbook for designing roadways for the aging population. (Report No. FHWA-SA-14-015). Washington, DC: Federal Highway Administration.
34. ITNAmerica. (2015). What We Do: Research & Policy (Web page). Retrieved from the iTN website at: www.itnamerica.org/what-we-do/research-policy
35. Beverly Foundation. (2011, June). Supplemental Transportation Programs for Seniors. Washington, DC: AAA Foundation for Traffic Safety.
36. Dickerson, A. E., Meuel, D. B., Ridenour, C. D., & Cooper, K. (2014). Assessment tools predicting fitness to drive in older adults: a systematic review. *American Journal of Occupational Therapy*, 68, 670–680.
37. Satariano, W. A., Guralnik, J. M., Jackson, R. J., Marottoli, R. A., Phelan, E. A., & Prohaska, T. R. (2012). Mobility and aging: new directions for public health action. *American Journal of Public Health*, 102, 1508–1515.
38. Owsley, C., McGwin, G., Sloane, M., Wells, J., Stalvey, B. T., & Gauthreaux, S. (2002). Impact of cataract surgery on motor vehicle crash involvement by older adults. *Journal of the American Medical Association*, 288, 841–849.
39. Owsley, C., Stalvey, B. T., & Phillips, J. (2003). The efficacy of an educational intervention in promoting self-regulation among high risk-older drivers. *Accident Analysis & Prevention*, 35, 393–400.
40. Eby, D. W., Molnar, L. J., Shope, J. T., Vivoda, J. M, & Fordyce, T. A. (2003). Improving older driver knowledge and self- awareness through self-assessment. The Driving Decisions Workbook. *Journal of Safety Research*, 34, 371–381.
41. Roenker, D. L., Cissell, G. M., Ball, K. K., Wadley, V. G., & Edwards, J. D. (2003). Speed-of-processing and driving simulator training result in improved driving performance. *Human Factors*, 45, 218–233.

42. Marottoli, R. A., Allore, H., Araujo, K. L. B., Iannone, L. P., Acampora, D., Charpentier, P., & Peduzzi, P. (2007). A randomized trial of a physical conditioning program to enhance the driving performance of older persons. *Journal of General Internal Medicine*, 22, 590–597.
43. Marottoli, R. A., Allore, H., Araujo, K. L. B., Iannone, L. P., Acampora, D., Gottschalk, M, ..., Peduzzi, P. (2007). A randomized trial of an education program to enhance older driver performance. *The Journals of Gerontology, Series A: Biological Science and Medical Sciences*, 62A:113–119.
44. Stern, R. A., D'Ambrosio, L. A., Mohyde, M., Carruth, A., Tracton-Bishop, B., Hunter, J. C, ... Coughlin, J. F. (2008). At the crossroads: development and evaluation of a dementia caregiver group intervention to assist in driving cessation. *Gerontology & Geriatrics Education*, 29, 363–382.
45. Ball, K., Edwards, J.D., Ross, L. A., & McGwin, G. Jr. (2010) Cognitive training decreases motor vehicle collision involvement of older drivers. *Journal of the American Geriatric Society*, 58, 2107–2113.
46. Meuser, T. M., Carr, D. B., Irmiter, C., Schwartzberg, J. G., & Ulfarsson, G. F. (2010). The American Medical Association Older Driver Curriculum for health professionals: changes in trainee confidence, attitudes, and practice behavior. *Gerontology & Geriatrics Education*, 31, 290–309.
47. Liddle, J., Haynes, M., Pachana, N. A., Mitchell, G., McKenna, K., & Gustafsson, L. (2014). Effect of a group intervention to promote older adults' adjustment to driving cessation on community mobility: a randomized controlled trial. *Gerontologist*, 54, 409–422.

APPENDIX A

CPT® Codes

APPENDIX A

CPT® Codes

The following Current Procedural Terminology (CPT®) codes can be used for driver assessment and counseling, when applicable. These codes were taken from *Current Procedural Terminology (CPT®) 2015 Professional Edition*. Chicago, IL: American Medical Association; 2015.

When selecting the appropriate CPT® codes for driver assessment and counseling, first determine the primary reason for the patient's office visit, as usual. The services described in this Guide will most often fall under Evaluation and Management (E/M) services. Next, select the appropriate E/M category/subcategory. If you choose to apply codes from the Preventive Medicine services category, consult Table 1 for the appropriate codes. If any additional services are provided over and above the E/M services, codes from Table 2 may be additionally applied.

Table 1 Evaluation and Management—Preventive Medicine Services

If the primary reason for the patient's visit falls under the E/M category of Preventive Medicine Services, choose one of the following codes:

99386	40–64 years old	New Patient, Initial Comprehensive Preventive Medicine
99387	≥65 years old	Established Patient, Office or Outpatient Service
		Evaluation and management of an individual including an age- and gender-appropriate history, examination, counseling/anticipatory guidance/risk factor reduction interventions, and the ordering of appropriate immunizations(s), laboratory/diagnostic procedures. These codes can be used for a complete Preventive Medicine history and physical examination for a new patient (or one who has not been seen in 3 or more years), which may include assessment and counseling on driver safety. If significant driver assessment and counseling take place at the time of an office or outpatient service (99201-99215), Modifier-25 may be added to the codes above.
99396	40–64 years old	Established Patient, Periodic Comprehensive Preventive Medicine
99397	≥65 years old	Reevaluation and management of an individual including an age- and gender-appropriate history, examination, counseling/anticipatory guidance/risk factor reduction interventions, and the ordering of appropriate immunization(s), laboratory/diagnostic procedures.

Note: Codes from the Preventive Medicine Services 99386-99387 and 99396-99397 can be reported only once per year. If driver assessment and counseling take place at the time of an office or outpatient service (99201-99215), Modifier-25 may be added to the codes above.

Modifier-25 is appended to the office/outpatient service code to indicate that a significant, separately identifiable E/M service was provided by the same physician on the same day as the preventive medicine service. *See example below.*

99401	Approximately 15 minutes	Counseling and/or Risk Factor Reduction Intervention Preventive medicine counseling and risk factor reduction interventions provided as a separate encounter will vary with age and should address such issues as family problems, diet and exercise, substance abuse, sexual practices, injury prevention, dental health, and diagnostic and laboratory test results available at the time of the encounter. (These codes are not to be used to report counseling and risk factor reduction interventions provided to patients with symptoms or established illness.) These are time-based codes, to be reported based on the amount of time spent counseling the patient. Driver safety or driving retirement counseling fall under the category of injury prevention. Please note that for driving retirement counseling, a copy of the follow-up letter to the patient can be included in the patient's chart as additional documentation. <i>(A sample letter can be found in Chapter 6.)</i>
99402	Approximately 30 minutes	
99403	Approximately 45 minutes	
99404	Approximately 60 minutes	

Table 2 Additional Codes

The codes below can be used for administration of CADReS (see Chapter 3). If you complete the entire assessment, you can include codes 99420, 95831 and either 99172 or 99173. The CADReS Score Sheet can serve as the report.

99420	Administration and Interpretation of Health Risk Assessment Instrument
95831	Muscle and Range of Motion Testing Muscle testing, manual (separate procedure) with report; extremity (excluding hand) or trunk.
99172	Visual Function Screening Automated or semiautomated bilateral quantitative determination of visual acuity, ocular alignment, color vision by pseudoisochromatic plates, and field of vision (may include all or some screening of the determination[s] for contrast sensitivity, vision under glare).
99173	Screening Test of Visual Acuity, quantitative, bilateral The screening used must employ graduated visual acuity stimuli that allow a quantitative estimate of visual acuity (eg, Snellen chart).
99406	Smoking and tobacco use cessation counseling visit; intermediate, longer than 3

	minutes up to 10 minutes
99407	Smoking and tobacco use cessation counseling visit; intensive, longer than 10 minutes
99408	Alcohol and/or substance (other than tobacco) abuse structured screening (eg, AUDIT, DAST), and brief intervention (SBI) services; 15–30 minutes
99409	Alcohol and/or substance (other than tobacco) abuse structured screening (eg, AUDIT, DAST), and brief intervention (SBI) services; longer than 30 minutes

Example

Periodic comprehensive preventive medicine evaluation for an 82-year-old woman with hypertension, diet-controlled type 2 diabetes mellitus, and osteoarthritis. She is accompanied by her daughter, who requests an evaluation because of concern about her mother’s driving safety.

During the appointment, the patient reports that she has had a cough and a low-grade fever over the last week.

In addition to performing the comprehensive preventive medicine examination, the physician performs a problem-focused history and examination to evaluate the cough and fever.

The following codes are applied:

99397 Established Patient, Periodic Comprehensive Preventive Medicine, ≥65 years old

99212-25 Office or other outpatient visit, with Modifier-25 indicating that a significant separately identifiable E/M service was provided by the same physician on the same day as the preventive medicine service

APPENDIX B

Patient and Caregiver Educational Material

- Am I a Safe Driver?
- Getting by Without Driving
- How to Assist the Older Driver
- NHTSA's How to Understand and Influence Older Drivers
- Ten Tips to Aging Well
- Tips for Safe Driving

Patient and Caregiver Educational Materials

These handouts were designed to be user-friendly and simple to read. All patient education materials were written at or below a 6th grade reading level, and all family and caregiver material was written at a 7th grade reading level.

We encourage physicians to make copies of these handouts for their patients, have them available in the office setting, educate office staff to distribute them when appropriate, and use them as talking points when discussing driving issues with patients.

Am I a Safe Driver?

Check the box if the statement applies to you.

- ☐ I get lost while driving.
- ☐ My friends or family members say they are worried about my driving.
- ☐ Other cars seem to appear from nowhere.
- ☐ I have trouble finding and reading signs in time to respond to them.
- ☐ Other drivers drive too fast.
- ☐ Other drivers often honk at me.
- ☐ Driving stresses me out.
- ☐ After driving, I feel tired.
- ☐ I feel sleepy when I drive.
- ☐ I have had more “near-misses” lately.
- ☐ Busy intersections bother me.
- ☐ Left-hand turns make me nervous.
- ☐ The glare from oncoming headlights bothers me.
- ☐ My medication makes me dizzy or drowsy.
- ☐ I have trouble turning the steering wheel.
- ☐ I have trouble pushing down the foot pedal.
- ☐ I have trouble looking over my shoulder when I back up.
- ☐ I have been stopped by the police for my driving.
- ☐ People no longer will accept rides from me.
- ☐ I have difficulty backing up.
- ☐ I have had accidents that were my fault in the past year.

- ☐ I am too cautious when driving.
- ☐ I sometimes forget to use my mirrors or signals.
- ☐ I sometimes forget to check for oncoming traffic.
- ☐ I have more trouble parking lately.

If you have checked any of the boxes, your safety may be at risk when you drive.

Talk to your doctor about ways to improve your safety when you drive.

Getting By Without Driving

Who doesn't drive?

If you live long enough, you will eventually have to stop driving. The average male will have seven years without the ability to drive, and the average female ten years! Many people choose to stop driving because of the hassle and expense of auto insurance, car maintenance, and gasoline. Other people stop driving because they feel unsafe on the road. And some people have never learned to drive!

If you don't drive, you're in good company. Although most Americans use their cars to get around, many people get by just fine without one. In this sheet, we suggest ways to get by without driving.

Where can you find a ride?

Here are some ways to get a ride. See which ones work best for you.

- **Ask for a friend or relative for a ride.** Offer to pay for the gasoline.
- **Take public transportation.** Can a train, subway, or bus take you where you need to go? Call your regional transit authority and ask for directions.
- **Take a taxi cab.** To cut down costs, try sharing a cab with friends or find out if your community offers discounted fares for seniors.
- **Ride a senior transit shuttle.** Call your community center or local Area Agency on Aging to see if your neighborhood has a shuttle service.
- **Ask about volunteer drivers.** Call your community center, church, synagogue, temple, or mosque to see if they have a volunteer driver program.
- **Ride a Medi-car.** If you need a ride to your doctor's office, call your local Area Agency on Aging to see if a Medi-car can get you there.

If you can't go out to get something, have it come to you.

Many stores can deliver their products straight to your door.

- **Have your groceries delivered.** Many stores deliver for free or for a low fee. You can even call your family and friends, or volunteers from your local community center, church, synagogue, temple, or mosque to see if someone can pick up your groceries
- **Order your medicines by mail.** Not only is this more convenient—it's often less expensive, too.

Order only from pharmacies that you know and trust. Some pharmacists will also deliver medications to the home.

- **Have your meals delivered to you.** Many restaurants will deliver meals for free or for a low fee. Also, you may be eligible for Meals-on-Wheels, a program that delivers hot meals at low cost. Call your local Area Agency on Aging for more information about Meals-on-Wheels.
- **Shop from catalogs.** You can buy almost anything you need from catalogs: clothing, pet food, toiletries, gifts, and more! Many catalogs are now online, with the most recent selections available from Internet websites.

Who can tell me more about services in my area?

The following agencies can provide you with information to get you started:

Area Agency on Aging (AAA) Eldercare Locator

www.eldercare.gov

800-677-1116 weekdays

Call this toll-free number and ask for the phone number of your local Area Agency on Aging (AAA). Your local AAA can tell you more about ride options, Meals-on-Wheels, and senior recreation centers in your area.

Administration on Aging Resource Directory for Older People

<https://chs-nhlbi.org/node/5868>

800-677-1116

Call this toll-free number and ask the National Institute on Aging to send you their Resource Directory for Older People. This 120-page directory lists organizations that provide services for older people.

Where Can I Find More Information?

We've listed additional resources on the following pages to help you assess and enhance driving safety for the retired driver. Some resources can help you create a transportation plan for your loved one.

Aging Life Care Association

<http://www.aginglifecare.org/>

520-881-8008

A geriatric care manager can help older people and their families arrange long-term care, including transportation services. Call the phone number or visit the Web site above to find a geriatric care manager in your loved one's area.

National Association of Social Workers (NASW)

www.socialworkers.org/register/default.asp

A social worker can provide counseling to your loved one, assess his/her social and emotional needs, and assist in locating and coordinating transportation and community services. To find a qualified clinical social worker in your loved one's area, search the *NASW Register of Clinical Social Workers* on the Internet.

Alternative Transportation Options

American Administration on Aging (AOA)

Eldercare locator

Assists in finding older adult resources in your community.

www.eldercare.gov

Community Transportation Association (CTAA)

Information on transportation in the United States.

www.ctaa.org/ntrc/

American Public Transportation Association (APTA)

Locate a local transportation provider in your community.

www.publictransportation.org/systems/

Easter Seals

Transportation solutions for caregivers

http://es.easterseals.com/site/DocServer/Transportation_Solutions.pdf?docID=2081

National Center for Senior Transportation

Transportation options for older adults.

www.seniortransportation.net/Portals/0/Cache/Pages/Resources/Trans_Options_Panels.pdf

Local Agency on Aging

Assists in finding resources for the aging in your community.

www.n4a.org/

Seniors on the MOVE

Assists with relocating to another community.

www.seniorsonthemoveinc.com

National Association of Social Workers (NASW)

Locate a social worker near you.

www.socialworkers.org/register/default.asp

United We Ride

Coordination of transportation services.

www.unitedweride.gov

How to Assist the Older Driver

As experienced drivers age, changes in vision, reaction time, and/or medical conditions may cause them to drive less safely. Sometimes these changes happen so slowly that drivers may not even be aware that their skills have declined.

If you have concerns about someone's driving safety, here's what you can do to keep your older driver safe AND mobile.

Is your loved one a safe driver?

If you have the chance, go for a ride with this driver. Look for the following warning signs in his/her driving:

- Forgets to buckle up (use seat belts)
- Does not obey stop signs or red traffic lights
- Fails to yield right of way
- Drives too slowly or quickly
- Often gets lost, even on familiar routes
- Stops at a green light or at the wrong time
- Doesn't seem to notice other cars, walkers, or bike riders on the road
- Doesn't stay in the lane
- Gets honked at or passed often
- Reacts slowly to driving situations
- Makes poor driving decisions
- Fails to use mirrors, check for blind spots, use turn signals
- Mixes up gas and brake pedal or no longer can use them smoothly
- Too cautious or too aggressive when driving

Other signs of unsafe driving:

- Recent near misses or fender benders
- Recent tickets for moving violations

- Repeated comments from those riding with your driver or watching them in traffic about close calls, near misses, or the driver not seeing other vehicles.
- Accidents, especially those that were the driver's fault.
- Recent increase in the car insurance premium

Riding with or following your driver, every once in a while, is one way to keep track of your loved one's driving. Another way is by talking to the spouse or friends of the driver you are concerned about.

If you are concerned about your loved one's driving, what can you do?

Talk to your loved one. Say that you are concerned about his/her driving safety. Ask if he or she shares your concern.

- Don't bring up your concerns while driving. It's dangerous to distract the driver! Wait until he or she is calm and you have the driver's full attention.
- Explain why you are concerned. Give specific reasons—for example, a medical condition like poor vision, recent fender benders, getting lost, or running stop signs.
- Realize that your loved one may become negative or defensive. After all, driving is important for independence and self-esteem.
- If the person you are concerned about does not want to talk about driving at that time, bring it up again later. Your continued concern and support may help your loved one feel more comfortable with this topic.
- Be a good listener. Take your loved one's concerns seriously.
- Consider using a handout like the Hartford's "We Need to Talk" which can be accessed at the following website: www.thehartford.com/talkwitholderdrivers/brochure/brochure.htm or writing the Hartford and requesting brochures at:

The Hartford
We Need to Talk
200 Executive Boulevard
Southington, CT 06489

Help make plans for transportation. When your loved one is ready to talk about his/her driving safety, you can work together to create plans for future safety.

- Make a formal agreement about driving. In this agreement, your loved one chooses a

person to tell him/her when it is no longer safe to drive.

This individual then agrees to help your loved one make the transition to driving retirement.

(You can find a sample agreement in *At the Crossroads: A Guide to Alzheimer's Disease, Dementia & Driving*. Order a free copy by writing to At the Crossroads booklet, The Hartford, 200 Executive Boulevard, Southington, CT, 06489.)

- Help create a transportation plan. Your loved one may rely less on driving if he/she has other ways to get around. Starting to use other ways to travel even before the person stops driving may make the change easier in the future.

Encourage a visit to the doctor. The doctor can examine a person's medical history, medication regimen, and current health to see if any of these may be affecting his/her driving safety. If so, the doctor can provide treatment to help improve medical conditions and possibly driving safety.

Encourage your loved one to take a driving test.

A driver rehabilitation specialist (DRS) can assess a person's driving safety through an office exam and driving test. The DRS can also teach special techniques or provide special equipment to help a person drive more safely. (To find a DRS in your area, ask your doctor for a referral or contact:

The Association for Driver Rehabilitation Specialists (ADED):

<http://www.aded.net/>

Also provides a locating tool for finding a DRS near you:

<http://aded.site-ym.com/search/custom.asp?id=1984>

If a DRS is not available in your area, contact a local driving school or your state's Department of Motor Vehicles to see if they can do a driving test.

How to help when your loved one needs to stop driving.

At some point, your loved one may need to stop driving for his/her own safety and the safety of others. You and your family members may come to this decision yourselves, or at the recommendation of the doctor, a driver rehabilitation specialist, driving instructor, or the Department of Motor Vehicles. When someone close to you retires from driving, there are several things you can do to make this easier for him/her:

- Help create a transportation plan. It may be easier for someone to give up driving if they are aware of other ways to get around. Help them create a list of "tried-and-true" ride

options.

This list can include:

- The names and phone numbers of friends and relatives who are willing to give rides, with the days and times they are available. You should even consider writing in specific duties, dates, and times, with the places your loved one needs to go and the name of the driver on a calendar to make this a reality.
- The phone number of a local cab company.
- Which bus or train to take to get to a specific destination. Try riding with your loved one the first time to make him/her feel comfortable.

(This may not be possible for many people with physical weakness or arthritis and certainly could not be done for those with memory or thinking problems.)

- The phone number for a shuttle service. Call your community center and regional transit authority to see if they offer a door-to-door shuttle service for older passengers.
- The names and phone numbers of volunteer drivers. Call your community center, church, synagogue, temple, or mosque to see if they have a volunteer driver program.
- If you need help finding other ride options, contact your local Area Agency on Aging.

Local Agency on Aging

Assists in finding resources for the aging in your community.

www.eldercare.gov

If your loved one can't go shopping, help him/ her shop from home. Arrange for medicines and groceries to be delivered. Explore online ordering or subscribe to catalogs and “go shopping” at home. Locate which services make house calls—local hairdressers or barbers may be able to stop by for a home visit.

Encourage social activities. Visits with friends, time spent at the senior center, and volunteer work are important for health and well-being. When creating a transportation plan, don't forget to include rides to social activities. It's especially important to maintain social contacts and keep spirits up during this time of adjustment.

Be there for your loved one. Let the person you care for know that he or she has your support.

Offer assistance willingly and be a good listener. This may be an emotionally difficult time, and it's important to show that you care. You may need to find additional family members or friends to help with this discussion.

How to Understand & Influence Older Drivers



Contents

Preface..... 1

Talking About Driving Safely2

 Step 1: Collecting Information2

 Step 2: Developing a Plan of Action.....8

 Step 3: Following Through on the Plan11

Developing a Mobility Action Plan.....12

PREFACE

For most of us, driving represents freedom, control, and competence. Driving lets us go to the places we want or need to go. For many of us – even as we get older – driving is important economically. We drive to get to and from work, and sometimes as part of our jobs. Driving is important socially; it lets us stay connected to our communities and favorite activities.

Driving appears to be relatively easy, but in fact it is a complex skill. Our ability to drive safely is affected by changes in our physical and mental conditions. Many of these changes take place as we get older, though in different ways and at different times.

Research shows that age is not the *sole* predictor of driving ability and safety. But there is ample evidence to show that most of us experience age-related declines in our physical and mental abilities – declines that can signal a greater crash risk.

One key to safety is knowing when a driver is at increased risk – even if we ourselves are that driver. So we must know what signs to look for, and pay attention to them. We need to understand how our driving environment changes, and what we should do to respond to those changes. We can learn about community resources that can keep us driving safely longer or keep us connected to the activities in our lives if we must cut back or stop driving altogether.

Driving or riding in a car is how most older adults get around. Most people 65 and older change how they drive as they age, choosing to drive only during daylight hours, for example, or limiting where they drive, or cutting back on how often they drive. This booklet helps families and friends of older drivers understand when and how such changes may be needed and how to keep older persons better connected to the people and activities that are important to them.

This booklet is also intended to broaden the discussion about older driver safety and mobility. It:

- gives information on helping older drivers make informed decisions about their driving behavior, and
- lists suggestions on how to begin conversations with the older driver about safety concerns. These conversations seldom happen often enough, and when they do, the older person fears – sometimes accurately – that someone is trying to take the car keys away. Unfortunately, discussions about continuing to drive often begin too late. And very often, families are asking the wrong questions.

The decision about driving for older adults is an emotionally charged issue, but it does not have to be that way.



TALKING ABOUT DRIVING SAFELY

Talking with an older person about their driving is often difficult. Most of us delay that talk until the person's driving has become what we believe to be dangerous. At that point, conversations can be tense and awkward for everyone involved. But there are things you can say and do to make those conversations more productive and less tense.

To hold such a discussion you should take three steps:

- ▶ collect information;
- ▶ develop a plan of action; and
- ▶ follow through on the plan.

Step 1: Collecting Information

The first step requires family and friends to collect information about what is happening with the older driver. This takes time and may require gathering information from a variety of people who have opportunities to observe the older person's driving.

The more information you collect, the better and more complete a picture of the driver you will have, and the more informed your discussions can be. The information can help you, other family members, health care professionals, and the older driver decide what needs to be done.

A word of caution: It is not uncommon for families, caregivers, and friends to be wrong in their judgment of a driver's risk or driving ability. A person's driving performance – not age – is what determines fitness to drive. Collecting a variety of information can give you more confidence in the accuracy of the determination that something needs to be done.

Even collecting the best information and planning ahead does not mean the decision about what to do with an at-risk or unsafe driver will be easy. But the information and planning can give all concerned more assurance that the best interest of the older driver is at the center of the decision making process.

Your observations

Your concern about the driving behavior of a family member or friend may stem from your observations of the person driving, stories about the

driver, or both. It's important to turn that concern to action. Be deliberate and careful about recording your own observations and observations of other people about the driver. Are there trends that signal the person may be at increased risk while driving? Be sure to date the written notes on your observations. If the driver's physician becomes involved in the driving decision at a later time, the dated notes will become helpful.

To get the most complete picture, collect information not only about their driving but also about other personal indicators (described below) because these may signal the person is at risk while driving.

Driving Observations

Ideally, you will have a conversation about your interest in ensuring that the driver remains safe on the road. Explain that riding with the driver is the best, most practical way to make observations about his or her driving. Another option may be to follow the driver in your own vehicle.

You should watch the person drive at different times of the day, in different types of traffic, and in different road conditions and weather. Over time, a picture will emerge of things the driver can do well and things the driver may not do as well.

You should be paying attention to make sure that the driver:

- stops at all stop signs and looks both ways to check for cross traffic;
- stops at red lights;
- appropriately yields the right-of-way;
- responds properly to other vehicles, motorcyclists, bicyclists, pedestrians, and road hazards;
- merges and changes lanes safely; and
- stays in the lane when turning and driving straight.

In addition, you want to observe whether the person is:

- slowing or stopping inappropriately, such as at green lights or in intersections;
- driving too fast for road conditions;
- driving so slowly as to impede the safe flow of traffic;
- driving aggressively; or
- getting lost routinely on routes that should be familiar for the driver.

Obviously, some of these driving behaviors pose an immediate concern. Drivers must stop at red lights and stop signs, and yield to other cars as the

traffic laws require. Failure to do these things puts the driver and others at extreme risk and requires immediate action to stop the driver.

Non-Driving Observations



Even when older people are not in the car, their actions, statements, or even the way they look may cause you concern or may indicate a problem that could threaten their safety when they are driving. Some of these things you see and hear may be triggered by major events happening in the person's life. These could include the loss of a spouse or a close friend. But an illness or changes in one's medications can also make it hard for the person to drive safely.

No single sign can be taken as a warning that the person is at risk or is an unsafe driver. But if you observe several of the warning signs, you should strongly consider taking action to help.

Such danger signals may include:

- ▮ forgetfulness (frequent and combined with other signs);
- ▮ unusual or excessive agitation;
- ▮ confusion and disorientation;
- ▮ loss of coordination and trouble with stiffness in joints;
- ▮ trouble walking, swallowing, hearing, or following verbal instructions;
- ▮ dizziness when changing positions, tripping, and falling;
- ▮ shortness of breath and general fatigue; and
- ▮ difficulty following verbal instructions, and/or giving inappropriate responses to those instructions.

At some time or another, many of us may have difficulty with some of the items above. But if you frequently observe these behaviors or signs in a family member or friend, they likely signal the need for you or a health professional to take action. These behaviors can indicate the person is at risk if he or she continues to drive.

Driver Self-Assessment

In addition to your own and others' observations about the older driver, encourage the person to evaluate his or her own driving performance. Several organizations have free self-assessment guides that a person can use. A self-assessment cannot solely determine whether or not the person is a safe driver.

But an assessment may prompt the person to be more open to a conversation with you and other concerned individuals about driving.

- AAA clubs have an assessment tool called “Roadwise Review” that people can use on their computers at home. Roadwise Review takes users through a series of brief tasks that examine a person’s vision, reaction time, and other measures related to driving safety. It also directs users to sources of more information about driving safety. Some AAA clubs charge for the screening tool, while others give it away free to members.
- AARP’s Driver Safety Program offers its “Are You a Smart Driver” self-assessment quiz, which asks drivers to answer ten questions about today’s driving environment and how they react to driving on today’s roads. Go to www.aarp.org/home-garden/transportation and click on the link in the “Are You a Smart Driver?” box.
- The AAA Foundation for Traffic Safety has a self-rating tool (<http://seniordriving.aaa.com>) that asks a person to respond to 15 statements about driving situations and gives suggestions based on the person’s answer.

Again, the value of these screening tools listed above is to prompt a person to talk with family and friends and health care professionals, and, if needed, to seek a more formal assessment of driving skills.

Observations of others in your community

Friends and professionals in the community often stand ready to help you get a more complete picture of the person whose safety may be at risk. In developing a complete picture of the older driver, however, it is crucial that you respect that driver’s dignity, privacy, and personal autonomy.

If you live in the same city or town, keeping tabs on how well a family member or friend is driving is easier than if you don’t live nearby. But either way, you need to build a network of helpers. They may be able to give you information to help determine whether action is needed to keep the older adult driver safe and sound.

Some members of the network – health care professionals including eye care specialists, pharmacists and physicians – cannot speak with you unless and until they have a signed release form from the driver.

Other Resources

Collecting information helps you develop an action plan, if one is needed, to enhance the safety and mobility of the older person. It can also help you to determine if actions need to be taken to reduce a person’s driving risk.

Physicians and law enforcement officers are often the first people families and friends go to when they seek outside help for a person they believe to be at-risk or unsafe driver.

Other community resources also exist to help you build a better action plan. These include your local:

- ▮ Area Agency on Aging;
- ▮ Driving Rehabilitation Specialist
- ▮ Department of Motor Vehicles office
- ▮ AAA (American Automobile Association) and AARP Driver Safety Programs
- ▮ Alzheimer's Association Chapter

Area Agencies on Aging

A network of more than 650 Area Agencies on Aging has been established nationwide to provide information about virtually all programs and services that are helpful to older people, their families, and caregivers. In many cases, Area Agencies can provide information about transportation choices available in the community. An agency may provide some of those programs and services directly or may arrange for them through contracts with other community service organizations. Call the Eldercare Locator at 800-677-1116 and ask for your local Office on Aging, or go to the web site at www.eldercare.gov.

Driver Rehabilitation Specialist

A driver rehabilitation specialist can provide an in-depth evaluation of a person's driving. The specialist can determine if and how a particular disease or condition such as Parkinson's, stroke, or diabetes is affecting a person's driving. The specialist, who is often an occupational therapist, may offer interventions such as training to improve the person's driving safety. The specialist also may suggest installing specialized equipment in the vehicle to keep a person driving safely longer, as well as provide the training on how to use that equipment.

To find a driving rehabilitation specialist near you, go to the American Occupational Therapy Association's Older Driver Resource Center at www.aota.org/en/Practice/Productive-Aging/Driving.aspx, or call the Association of Driver Rehabilitation Specialists at 866-672-9466, or go to its Web site at www.aded.net. You also can call hospitals and rehabilitation facilities in your area to find an occupational therapist to help with the driving skills assessment and intervention.

Department of Motor Vehicles

If, based on your personal observations or knowledge, you are concerned that a family member or friend has a medical condition or has experienced a mental decline that would lead to unsafe driving, contact the State's Department of Motor Vehicles (DMV) where the older driver lives.

In almost every State, a family member can report a driver to the DMV by writing a letter. Your letter should describe specific examples of what you consider to be unsafe driving behavior and/or medical conditions that you believe place the driver at risk. The DMV is required to carefully examine your claims to ensure the driver is not being harassed unfairly. Depending on your State, the letter you write may or may not be confidential, meaning the older driver could find out you have written the letter.

Even if the driver is re-examined and passes the required tests, the DMV may still require future periodic reviews. The DMV may require the driver's physician to submit a report every so often. This would most frequently occur in cases involving an individual who has had seizures, for example. The DMV also might require periodic road tests, such as for people with progressive medical conditions or some forms of dementia. Finally, the DMV may require the driver to submit a report from an eye care specialist if the person has a progressive eye disease such as macular degeneration.



Before contacting the DMV about the person's driving behavior, a family member or friend should carefully consider sitting down with the driver first to discuss the concerns and possible plans of action that best meet everyone's needs and concerns.

AAA/AARP Driver Safety Programs

Several national organizations offer educational programs for older adult drivers. These "refresher" courses present participants with up to 10 hours of classroom tips and reminders about driving safely on today's roads.

AARP's Driver Safety Program is the largest national program that educates older adults on driving safely, self-assessment, and finding transportation alternatives. Go to www.aarp.org/home-garden/transportation/driver_safety and click on the link in the "Find a Class Near You" box.

The AAA and the National Safety Council also offer courses through many of their local offices. Insurers in most States offer a car insurance discount for individuals who complete these classroom "refresher" courses. Sometimes the discount applies for several years after the course is taken. At that time, however, the individual must re-take the course to renew the insurance discount.

Alzheimer's Association Chapter

For someone who has been diagnosed with Alzheimer's disease or other dementia, the issue is not whether the person will have to stop driving, it is *when* that must happen. There are some early and clear warning signs that Alzheimer's is affecting a person's ability to drive safely. These signs include, but are not limited to, when the driver:

- ▮ drifts out of the lane;
- ▮ becomes confused when exiting or entering a highway;
- ▮ has trouble making turns, especially left turns;
- ▮ gets lost in familiar places; or
- ▮ stops inappropriately – such as at green lights or in the middle of an intersection when not turning.

Local Alzheimer's Association chapters or local Alzheimer's support groups have caring people with expertise in helping families and caregivers deal with the driving issue. To find your local Alzheimer's support group:

- ▮ contact your local Area Agency on Aging
 Call the Eldercare Locator at 800-677-1116
 Monday through Friday, 9 a.m. to 8 p.m. (ET),
 or go on-line to www.eldercare.gov.
- ▮ Go on-line or call the Alzheimer's Disease Education and Referral Center:
<http://www.nia.nih.gov/alzheimers>.
 800-438-4380

Step 2: Developing a Plan of Action

In Step 1, you were encouraged to collect a broad sampling of information about the person's driving, and other behaviors and actions. From this you will need to look at options for formally assessing driving skills, and transportation resources other than driving available in the community.

Once you have this information, sit down and talk with the person to determine:

- ▮ Is the person driving safely within the acknowledged limits of his or her capabilities?
- ▮ If there is a problem, is it correctable?
- ▮ Do other transportation options need to be identified?

Tips for Conversation

If the information you collected indicates a safety problem, you can do several things to increase the likelihood that a conversation about driving will go well.

1. Base the recommendations in the action plan on the observations from Step 1 (page 2).
2. Be sensitive to ways you can help older adults preserve their self-respect. Try reasoning and use compassion. Appreciate the significance of a driver's license to the older person. Empathize with and listen to the older driver.
3. To lead the conversation, pick someone in the family or a trusted friend who the older adult driver may "hear" better than others. In some families, it works better to have just one person have the conversation. In other families, having several family members express their concern will underscore the family's concern for the older person's safety.
4. Present your concerns in the least-threatening terms of your own feelings and perceptions. Use "I" messages rather than "You" messages. For example, say, "I am concerned about your safety when you are driving," rather than, "You're no longer a safe driver."
5. Among the points you might want to make in your conversation:
 - Indicate that you have noticed changes in the person that seem to be making it more difficult to drive.
 - Note that we all age in different ways and at different rates.
 - Reinforce that thousands of older adults each day are taking control of similar situations by changing how and when they drive. Many stop driving at night or avoid rush-hour traffic and bad weather. Many stick to familiar nearby streets and rearrange their schedules to keep doing the things that keep them active in their communities, such as volunteering and socializing.
6. Don't be put off by negative reactions. Remember that it is hard for people to cut back on or stop their driving if they are not ready to do so, or if they believe they are good drivers. Major lifestyle changes are never easy.
7. Highlight a positive outcome by focusing on how the older adult driver will be able to continue to stay connected to specific things that are important. Do *not* judge the person's priorities.
8. If possible, identify a trusted friend or family member who has already had to cut back on or stop driving, and who is taking actions to stay connected to the things that are important to them. Ask if he or she would



be willing to speak with the older person about how it is possible to keep connected to meaningful activities in the community.

If you still believe that there is a safety problem, *work together* to develop a written action plan (see sample plan on page 13.) Ideally, discussing a plan of action should take place *before* problems exist. Regardless of the timing, however, the goal of such a plan should be to preserve the independence and freedom of the person. The plan should keep the person connected to the activities that give meaning to and that enhance the quality of life.

Developing that plan will take time. It will involve a series of conversations with the person. While many concerned family members and friends might play a central role in holding these conversations, others might turn to health



professionals, such as a physician, to start and/or continue the discussion about driver safety. In many of those cases, the family and friends serve more in a support role for the older person.

The focus of any action plan should be (1) to enhance the independence and decision-making of the older adult, and (2) to maximize community safety. Determine if there are situations where the person can continue to drive successfully. In some cases, the plan may require

changing the time of day when the older person does errands or drives to appointments to avoid heavy traffic. In other cases, the plan may require changing places where one shops or socializes with friends to avoid driving on busy roads or in more dangerous driving situations. It may also mean doing an activity less often or arranging for the person to carpool to an activity and thus share the driving responsibility.

Implementing a plan that changes how and when a person drives can have an enormous effect on families. Families themselves often must begin to play more active roles in ensuring the older adult can continue to get around the community. For family members who live nearby, the change in roles may mean providing rides for the older person; whereas for family who live more than an hour away, the change could mean spending time on the phone to coordinate transportation services or providing financial support to pay for those services.

Action plans range from the simple to the complex. An action plan might call for the older adult to get a formal driving evaluation from a driving rehabilitation specialist to identify areas of strength and need. A plan also might clearly spell out ways people can get to events and activities when they cannot drive themselves.

Many communities have programs offered through public transportation systems that give people practice and confidence in using public transportation to get around. Still, many older adults are reluctant for several reasons to use public transportation when they stop driving. Some older adults with health problems may not find these options practical or possible. Therefore, it is important for older adults to become familiar with and confident using transportation alternatives *before* they are asked to become reliant on alternatives to their car.

As noted earlier, *Area Agencies on Aging* have information about virtually all transportation programs and services in their areas. To find information about your local Area Agency on Aging, contact the Eldercare Locator, a national service you can call toll-free at 800-677-1116. Ask for your local Office on Aging, or go to the Web site at www.eldercare.gov.

Step 3: Following Through on the Plan

Older adult drivers should be deeply involved in every step of their transportation planning and implementation process. Doing so demonstrates that family members respect the older person's opinions and needs, are genuinely concerned about the older person's safety, and have given the issue significant thought, time, and attention. The conversation about putting the plan into action needs to be approached with sensitivity and respect for the older person. Even if the older person has been involved in developing the action plan, the conversation can easily provoke anger, defensiveness and denial. This is less likely to happen if the older driver has been involved in each step of the planning process.

Review the Plan Periodically

Over time, changes in a person's abilities or even interests can mean that adjustments need to be made to the older person's action plan so that he or she can get around the community safely. Therefore, it is important to review the transportation plan at least twice a year to ensure it still works for the person who has had to reduce or stop his or her driving.

Families and friends also need to remember that many communities are developing new community transportation resources and are refining existing ones. Some of these new resources may better meet the needs of the older person than those that you have listed in your current plan. The key: keep in touch with your local Area Agency on Aging to find out if new and better choices are available to the older person.

DEVELOPING A MOBILITY ACTION PLAN

The goal of the action plan is to keep the older person on the go (“mobile”) in and around the community and connected to the activities that give the person’s life meaning. Ideally, the person who is cutting back on driving or stopping driving can continue to take part in all current activities. But that person may need to find other ways to get to the activity, to get an errand completed, or to find other times to participate in such activities.

Case in Point

William, 79, has been playing cards with a group of friends each Wednesday evening for the past six years. But during the past several months, driving at night has become more difficult because of the glare of headlights. William does not want to ask his son for a ride, public transportation doesn’t run close to his friend’s house where the game is always held, and taxis don’t fit in his budget. Yet William also doesn’t want to give up playing, which keeps him connected with friends and gets him out of the house for one of the few times each week to socialize. After a few phone calls, William works out that he’ll host the game once a month and those other times he’ll bring refreshments to the game in exchange for one of his playing partners driving him to the game.

In filling out the chart below, list *all* of those activities that fit. Do not leave off events or activities because you believe they are not “essential.” Again, the goal of this action plan is to list needs and find alternative ways, if necessary, to meet those needs. It may be accomplished by changing the times or locations where the activities take place, identifying alternative means of getting to the activities, or agreeing to carpool or share rides to activities. For example, if a person has difficulty getting out to the grocery store, the person should consider the value of having groceries delivered to the house.

Routine Errands

(List activities such as going to the grocery store, the pharmacy, the hairdresser, or the doctor.)

Activity	How You Get There Now	New Ways to Complete Errand

Regular Educational, Social or Religious Events/Activities

(List events that happen at least once a month, such as going to an adult learning center, senior center or attending religious services.)

Activity	How You Get There Now	New Ways to Get There

Other Community, Social and/or Special Events

(List special events such as birthday parties, community fairs, voting, or events that may happen on the spur of the moment, such as going out to dinner or a movie.)

Activity	How You Get There Now	New Ways to Get There

NOTES

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....



10 Tips for Aging Well

SIMPLY LIVING LONGER ISN'T ENOUGH. What we really want is to live longer well, staying healthy enough to continue doing the things we love. While having good genes certainly helps, a growing body of research suggests that how well you age depends largely on you and what you do. Fortunately, research also finds that it's never too late to make changes that can help you live a longer and healthier life.

Here, from the American Geriatrics Society's Health in Aging Foundation, are ten tips for living longer and better:

EAT A RAINBOW

You need fewer calories when you get older, so choose nutrient-rich foods like brightly colored fruits and vegetables. Eat a range of colors—the more varied, the wider the range of nutrients you're likely to get. Aim for two servings of salmon, sardines, brook trout or other fish rich in heart healthy omega-3 fatty acids a week. Limit red meat and whole-fat dairy products. And choose whole grains over the refined stuff.

SIDESTEP FALLS

Walking as little as 30 minutes, three times a week can help you stay physically fit and mentally sharp, strengthen your bones, lift your spirits—and lower your risk of falls. That's important because falls are a leading cause of fractures, other serious injuries, and death among older adults. Bicycling, dancing, and jogging are also good weight-bearing exercises that can help strengthen your bones. In addition to exercising, get plenty of bone-healthy calcium and vitamin D daily.

TOAST WITH A SMALLER GLASS

Drinking a moderate amount of alcohol may lower your risks of heart disease and some other illnesses. But what's "moderate" changes with age. It means just 1 drink per day for older men and ½ a drink daily for older women. (A "drink" is 1 oz of hard liquor, 6 oz of wine, or 12 oz of beer.) Since alcohol can interact with certain drugs, ask your healthcare professional whether any alcohol is safe for you.

KNOW THE LOW-DOWN ON SLEEP IN LATER LIFE

Contrary to popular belief, older people don't need less sleep than younger adults. New recommendations from the National Sleep Foundation suggests 7 to 8 hours of shut-eye a night. If you're getting that much and are still sleepy during the day, see your healthcare professional. You may have a sleep disorder called sleep apnea. People with sleep apnea stop breathing briefly, but repeatedly, while sleeping. Among other things, untreated sleep apnea can increase your risk of developing heart disease.

FLATTEN YOUR (VIRTUAL) OPPONENT, SHARPEN YOUR MIND	Conquering your adversary in a complex computer game, joining a discussion club, learning a new language, and engaging in social give-and-take with other people can all help keep your brain sharp, studies suggest.
ENJOY SAFE SEX	Older adults are having sex more often and enjoying it more, research finds. Unfortunately, more older people are also being diagnosed with sexually transmitted diseases. To protect yourself, use a condom and a lubricant every time you have sex until you're in a monogamous relationship with someone whose sexual history you know.
GET A MEDICATIONS CHECK	When you visit your healthcare professional, bring either all of the prescription and over-the-counter medications, vitamins, herbs and supplements you take, or a complete list that notes the names of each, the doses you take, and how often you take them. Ask your healthcare provider to review everything you brought or put on your list. He or she should make sure they're safe for you to take, and that they don't interact in harmful ways. The older you are, and the more medicines you take, the more likely you are to experience medication side effects, even from drugs bought over-the-counter.
SPEAK UP WHEN YOU FEEL DOWN OR ANXIOUS	Roughly 1 in 5 older adults suffers from depression or anxiety. Lingering sadness, tiredness, loss of appetite or pleasure from things you once enjoyed, difficulty sleeping, worry, irritability, and wanting to be alone much of the time can all be signs that you need help. Tell your healthcare professional right away. There are many good treatments for these problems.
GET YOUR SHOTS	They're not just for kids! Must-have vaccines for seniors include those that protect against pneumonia, tetanus/diphtheria, shingles, and the flu, which kills thousands of older adults in the US every year.
FIND THE RIGHT HEALTHCARE PROFESSIONAL AND MAKE THE MOST OF YOUR VISITS	See your healthcare professional regularly, answer his or her questions frankly, ask any questions you have, and follow his or her advice. If you have multiple, chronic health problems, your best bet may be to see a geriatrics healthcare professional—someone with advanced training that prepares her to care for the most complex patients. The AGS' Health in Aging Foundation can help you find one; visit www.healthinaging.org .

Tips for Safe Driving

Tip #1: Drive with care.

Always—

- Plan your trips ahead of time. Decide what time to leave and which roads to take. Try to avoid heavy traffic, poor weather, and high-speed areas.
- Wear your seat belt—and wear it correctly. (It should go over your shoulder and across your lap.)
- Be sure you “fit” well in your car. Take advantage of a CarFit class (see resources) if one is available in your community.
- Drive at the speed limit. It’s unsafe to drive too fast or too slow.
- Be alert—pay attention to traffic at all times.
- Keep enough distance between you and the car in front of you.
- Be extra careful at intersections. Use your turn signals and remember to look around you for people and other cars.
- Check your blind spot when changing lanes or backing up.
- Be extremely careful with left hand turns, allowing enough time to pass through the intersection in case of on-coming traffic.
- Be extra careful at train tracks. Remember to look both ways for trains.
- When you take a new medicine, ask your doctor or pharmacist about side effects. Many medicines may affect your driving even when you feel fine. If your medicine makes you dizzy or drowsy, talk to your doctor to find out ways to take your medicine so it doesn’t affect your driving.

Never—

- Never drink and drive.
- Never drive when you feel angry or tired. If you start to feel tired, stop your car somewhere safe. Take a break until you feel more alert.
- Never drive if your medication is making you sleepy.
- Never use a cell phone when driving.
- Never eat, drink, or do other activities while driving.

- Never drive in icy or snowy weather.

If—

- If you don't see well in the dark, try not to drive at night or during storms.
- If you have trouble making left turns at an intersection, make three right turns instead of one left turn.
- If you can, avoid driving in bad weather such as rain, sleet, or snow.
- If a certain route always causes you stress, try to find an alternate route.
- If someone in the car is bothering you (e.g., noisy grandchildren) tell him or her to stop.

Tip #2: Take care of your car.

- Make sure you have enough gas in your car.
- Make sure your tires have the right amount of air and check them each month for any wear or damage.
- Get your car tuned up regularly.
- Keep your windshields and mirrors clean.
- Keep a cloth in your car for cleaning windows.
- Replace your windshield wiper blades when they get worn out.
- Consider using Rain-X or a similar product to keep your windows clear.
- If you are shopping for a new car, look for a car with power steering and automatic transmission.
- If you own a computer you can check to see how well a car will do if it is involved in a crash. This information is on the following Web site of the National Highway Traffic Safety Administration: www.safercar.gov. You might want to consider buying a car that has the highest rating when struck by another vehicle from the front or side.

Tip # 3: Know where you can find a ride.

How do you get around when your car is in the shop? If you don't know the answer to this question, it's time for you to put together a "transportation plan."

A transportation plan is a list of all the ways that you can get around. Use this list when your car is in the shop or when you don't feel safe driving.

Your transportation plan might include:

- Rides from friends and family
- Taxi
- Bus or train
- Senior shuttle
- Volunteer drivers from your local community or government center.

If you need help creating a transportation plan, your doctor can get you started.

Tip #4: Take a driver safety class.

To learn how to drive more safely, try taking a class. In a driver safety class, the instructor teaches you skills that you can use when you are driving.

To find a class near you, call one of the following programs:

AARP Driving Safety Program

The classic course with information on how to locate an educational venue in your community. http://www.aarp.org/home-garden/transportation/driver_safety/

American Safety Council

Mature Driver Course

<http://www.maturedrivercourse.com/>

Driving School Association of the Americas, Inc.

1-800-270-3722

These classes usually last several hours. These classes do not cost much money—some are even free. As an added bonus, you might receive a discount on your car insurance after taking one of these classes. Talk to your insurance agent and company to determine if they offer a discount.

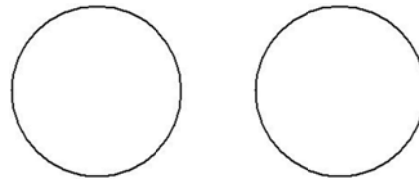
APPENDIX C

Clinical Team Resources

- Clinical Assessment of Driving Related Skills (CADReS) Score Sheet
- Evidence Table for Assessments (selected in Ch. 3)
- Medical Review Board Sample Letter
- Modified Driving Habits Questionnaire
- Montreal Cognitive Assessment (MoCA) and Form
- Motor Vehicle Adaptive Equipment Descriptions and NHTSA's Adapting Motor Vehicles for Older Drivers brochure
- Sample Driving Cessation Plan
- Snellen Chart
- Snellgrove Maze Test and Form
- Three Levels of Spectrum of Driver Services
- Trails A Test
- Trails B Test

Name: _____ Date: _____

1. **Visual fields:** Shade in any areas of deficit.



Patient's L R

2. **Visual acuity:** _____ OD _____ OS _____ OU

Was the patient wearing corrective lenses? If yes, please specify:

If acuity in either eye is worse than 20/40, consider referral to ophthalmologist.

3. **Rapid pace walk:** _____ seconds

Longer than 10 seconds is abnormal; consider referral for driving evaluation and/or evaluation of gait disorder. Was test performed with a walker or cane? If yes, please specify:

4. **Range of motion:** Specify “within normal limits (WNL)” or “not WNL.” If not WNL, describe.

	Right	Left
Neck rotation		
Finger curl		
Shoulder and elbow flexion		
Ankle plantar flexion		
Ankle dorsiflexion		

With any deficiencies or pain, consider referral to physical therapy for exercises or pain management or to occupational therapy if impacting ADLs/IADLs as indicated, and/or consider referral for comprehensive driving evaluation if adaptation for driving is needed.

5. **Maze Test:** Risk Categories _____ Seconds _____ Errors _____

If completed in 61 seconds or longer, with or without errors, then the person is not cognitively fit to drive safely.

If completed in up to 60 seconds, but with two or more errors, then the person is not

cognitively fit to drive safely.

If completed in up to 60 seconds, with zero or one error, then the person is cognitively fit to drive safely.

6. **MoCA:** Total score: _____

A score of 26 or above is normal (add a point if the older adult has less than 12 years of formal education). A score of 18 or less indicates driving safety risk. A score above 18 but below 26 warrants further evaluation, including a comprehensive driving evaluation.

7. **Trail-Making Test, Part B:** _____ seconds

A score longer than 180 seconds is abnormal; consider referral for a comprehensive driving evaluation and/or evaluation for cognitive, visual, or motor impairment.

8. **Clock-drawing test:** Please check “yes” or “no” to the following criteria.

	Yes	No
Only the numbers 1–12 are included (no duplicates or omissions).		
The numbers are drawn inside the clock circle.		
The numbers are spaced equally or nearly equally from each other.		
The numbers are spaced equally or nearly equally from the edge of the circle.		
One clock hand correctly points to 2.		
There are only two clock hands.		
There are no intrusive marks, writing, or hands indicating incorrect time.		

If any elements are abnormal, consider referral for a comprehensive driving evaluation clinic and/or evaluation for cognitive, visual, or motor impairment.

Assessment/Plan

Table of Selected Studies Supporting the use of Screening Tools in CADReS.

Citation	Target Population	Tools (significant)/Outcome Measure	Main Findings
Classen, S., Witter, D. P., Lanford, D. N., Okun, M. S., Rodriguez, R. L., Romrell, J., et al. (2011).	Parkinson's Disease	MMSE Rapid Pace Walk UFOV Acuity Contrast Sensitivity Outcome: Global rating score (on road outcome) and maneuvers scores for on road assessment	Individuals with PD did more poorly on UFOV, Rapid Pace Walk, global score of the BTW, and maneuvers scores. UFOV and Rapid Pace Walk accounted for most of variance with the on-road test and can be considered as good screening tools for PD.
Zook, N. A., Bennett, T. L., & Lane, M. (2009).	Older adult	Hopkins verbal learning task Integrated visual and auditory continuous performance Trails B Outcome: on road assessment	Hopkins verbal learning test, Integrated visual and auditory continuous performance, and Trails B more predictive of on-road than CBDI or UFOV.
Stav W. B., Justiss, M. D., McCarthy D. P., Mann, W. C., & Lanford, D. N. (2008).	Older adults	Contrast Sensitivity, slide B Rapid Pace Walk UFOV Rating MMSE total score Outcome: Global Rating Scale of the standardized road test	Using stepwise regression, the strongest model included: Contrast Sensitivity slide-B, Rapid Pace Walk, UFOV rating, and MMSE total score. These accounted for 44% of the variability in Global Rating Scale of the standardized road test. All assessments listed were significantly correlated with the Global Rating Score individually.
Wood, J. M., Anstey, K. J., Kerr, G. K., Lacherez, P. F., & Lord, S. (2008)	Older adults	UFOV 2 Dot motion sensitivity Knee extension strength Postural sway Trails B Color choice reaction time Outcome: on road assessment	UFOV 2, dot motion sensitivity, knee extension strength, postural sway, trail making B, and color choice reaction time were significantly correlated with on road assessment performance. Sensitivity: 91%, specificity: 70%

Molnar, F. J., Marshall, S. C., Man-Son-Hing, M., Wilson, K. G., Byszewski, A. M., & Stiell, I. (2007).	Older adults	MMSE Driving habits Ottawa Driving & dementia Bothered by diabetes Timed Toe Tap Test Outcome: motor vehicle crashes	Used assessment battery in ER for acceptability and potential predictors of crashes. Significant positive associations with past or current MVC were found for components of: MMSE, Driving Habits, Ottawa Driving and Dementia, “bothered a great deal by Diabetes Mellitus”, and the Timed Toe Tap Test.
De Raedt, R., & Ponjaert-Kristoffersen, I. (2001). De Raedt, R., & Ponjaert-Kristoffersen, I. (2001).	Older adults	Trail A Acuity Clock drawing Age as factor Outcome: on road assessment	Battery included: MMSE, Trail making, acuity, clock drawing, age as factor MMSE did not add anything to model. Combined: Specificity – 85% Sensitivity – 80%
Owsley, C., Stalvey, B.T., Wells, J., Sloane, M. E., & McGwin, G. (2001).	274 older adults with cataracts and 103 without	Tested for acuity, contrast sensitivity, and glare.	Contrast sensitivity strongly related to crashes, especially when in two eyes, but also one. Visual acuity – not related to crashes.
Decina, L.E. & Staplin, L. (1993).		Visual exams of 12,400 drivers in PA.	Acuity, visual fields, contrast sensitivity related to crashes for drivers 66-75 years and 76 years & over.
Freeman, E.E., Munoz, B., Turano, K.A., & West, S.K. (2005).	Older adults	Salisbury Eye Evaluation Project, 2520 older adults followed for 8 years with 4 collection points.	Driving cessation over time: Those with worse scores in acuity, contrast sensitivity, and visual field cut most likely to cease driving.
Crizzle, A.M., Classen, S., & Uc, Y. (2012).	PD	Evidence review that examined measures for predicting on road and simulator performance.	No standard battery is able to predict driving performance of PD, more vigorous studies needed. Some evidence for subtest 2 of UFOV, contrast sensitivity, Trails B and B-A, functional reach, Rey-Osterrieth Complex Figure Test.
Classen, S., McCarthy, D. P., Shechtman, O., Awadzi, K. D., Lanford, D.N., Okun, M. S., Rodriguez, R. L., Romrell, J., Bridges, S., Kluger, B., & Fernandez, H.	PD	19 individuals with Parkinson’s Disease and 104 age matched controls. Compared UFOV with on road assessment outcome, global rating scale, and sum of maneuvers scale.	UFOV had strongest correlations with on road and driving errors. Those who failed on-road did worse on Trails B and UFOV than those who passed. Cut off scores for UFOV subtests suggested.

H. (2009).			
Amick, M. M., Grace, J., & Ott, B. R. (2007).	PD	25 with Parkinson's Disease with two of three physical issues (tremor, bradykinesia, and rigidity). No cognitive impairments. Compared assessments to on road performance.	Safe and marginal groups performed differently on contrast sensitivity, Trails B (time), Rey-O presence/accuracy, UFOV subtest 3.
Uc, E.Y., Rizzo, M., Anderson, S.W., Shi, Q., & Dawson, J.D. (2005).	AD	33 Alzheimer's compared to 137 normal controls on cognitive tests, vision tests, on road drive to identify landmarks and traffic signs.	Significant difference between groups in landmark and traffic identification; Driving errors higher in AD group; Trails B, auditory verbal learning test, contrast sensitivity, judgment of line orientation were predictors of total landmark and traffic sign identification.
Grace, J., Amick, M. M., D'Abreu, A., Festa, E. K., Heindel, W. C., & Ott, B. R. (2005).	AD	21 dementia, 21 Parkinson, 21 controls. Compared motor and cognitive function with on road performance.	Dementia made significantly more errors on on-road than controls; Rey-Osterrieth figure was sensitive to poor on road performance, Trails A and B sensitive to dementia subjects.
Whelihan, W.M., DiCarlo, M.A., & Paul, R.H. (2004).	AD	23 with CDR of .5 and 23 controls. Battery of screening measures compared with outcome measure of road assessment.	Trails B, Maze navigation time, UFOV, letter cancelation significantly related to on-road for patient group, but for controls, it was only age. Regression showed maze navigation time, Trails B time, and UFOV part 1 accounted for 46% of variance (Trails B added insignificantly). UFOV too challenging for even early dementia. Maze navigation may be good screening tool.
Jones, V. C., Gielen, A. C., Bailey, M. M., Rebok, G. W., Gaines, J. M., Joyce, J. & Parrish, J. M. (2011).	Older adults	67 older adults screened with four of 9 assessment tools. High-risk completed qualitative interviews.	Identifying low, medium and high risk impairment of older adults with assessments and crash outcomes. Only Trails B differentiated the medium from the high risk group. UFOV and MVPT did not.
Edwards, J. D., Bart, E., O'Connor, M. L., & Cissell, G. (2010).	Older adults	1,248 participants tested at baseline and 5 years later on physical and cognitive issues.	Final regression models: Age at baseline, days driven per week and slower processing speed (UFOV performance, subtest 2) were significant indicators of risk for driving cessation. Other models showed rapid pace walk,

			MVPT, Trails B.
Munro, C.A., Jefferys, J., Gower, E. W., Munoz, B. E., Lyketsos, C. G., Keay, L., ... West, S. K. (2010).	Older adults	980 adults 67-87 years who had lane change data Subjects enrolled in the Salisbury Eye Evaluation and Driving Study	Significant predictors of lane change errors included: Brief Test of Attention, Hopkins, Trails B, VMI, and Visual Attention. Multiple regression demonstrated: Brief Test of Attention and VMI scores predicted lane change errors. Also those participants that resided in rural vs. urban predicted lane change error. Made on assumption that lane change translates into errors of driver safety.
Classen, S., Horgas, A., Awadzi, K., Messinger-Rapport, B., Shechtman, O., & Joo, Y. (2008).	Older adults	127 older adults to compare demographics, cognitive functioning, comorbidities, medications, and failing driving evaluation.	The strongest predictor of failing the BTW was advanced age, and time to complete Trails B were major predictors of failure and driving errors. Having a neurological diagnosis was associated with test failure and increased driving errors.
Oswanski, M. F., Sharma, O. P., Raj, S. S., Vassar, L. A., Woods, K. L., Sargent, W. M., & Pitock, R. J. (2007).		Retrospective study 232 over 55 years old referred to driving program. Subjects categorized into two groups: capable & incapable	Mean score for the three measurements significantly different between two groups. ROC for MVPT was ≥ 32 with 60% sensitivity and 83% specificity. ROC clock task was ≥ 3 with 70% sensitivity and 65% specificity. Processing time ≤ 6.27 seconds with 61% sensitivity and 79% specificity

This table was modified from Tables developed with funding from the Gaps and Pathways Project, the AOTA/NHTSA Cooperative Agreement.

[Official letterhead, state licensing authority or the state transportation Medical Advisory Board]

Dear Mr./Mrs. _____:

You are receiving this letter because it has come to our attention that you may have a medical condition that could affect your driving. Please provide the information requested on the enclosed form within the next 30 days.

Upon receipt of your form, our staff will perform a thorough, individual review of your medical fitness to continue driving. Additional information or assessments may be requested in order to complete your review. This may include information from your primary health care provider or an assessment by a driving rehabilitation specialist.

The purpose of this action is safety for you, your family, and the community. Because of the broader commitment to highway safety, drivers that fail to respond and/or provide the information requested by the due date may be considered for suspension of their driving privilege.

Sincerely,

State Licensing Authority/ State Transportation Medical Advisory Board

Modified Driving Habits Questionnaire

Current Driving

1. Do you wear glasses or contacts when you drive? ____ Yes ____ No
2. Do you wear a seatbelt when you drive? ____ Always ____ Sometimes ____ Never
3. Which way do you prefer to get around?
____ Drive yourself
____ Have someone drive you
____ Use public transportation or a taxi
4. How fast do you usually drive compared with the general flow of traffic?
____ Much faster ____ Somewhat slower
____ Somewhat faster ____ Much slower
____ About the same
5. Has anyone suggested over the past year that you limit your driving or stop driving?
____ Yes ____ No
6. How would you rate the quality of your driving?
____ Excellent ____ Good ____ Average ____ Fair ____ Poor
7. If you had to go somewhere and didn't want to drive yourself, what would you do?
____ Ask a friend or relative to drive you
____ Call a taxi or take the bus
____ Drive yourself regardless of how you feel
____ Cancel or postpone your plans and stay at home
____ Other (specify): _____

Exposure

8. In an average week, how many days per week do you normally drive? ____ days per week
9. Please consider all the places you drive in a typical week. Check those places and list how many times a week and the number of miles from home.

____ Store	____ times a week	____ miles from home
____ Church	____ times a week	____ miles from home
____ Work/School	____ times a week	____ miles from home
____ Relative's home	____ times a week	____ miles from home
____ Friend's home	____ times a week	____ miles from home
____ Out to eat	____ times a week	____ miles from home

____ Appointments ____ times a week ____ miles from home

Are there other places you go in a typical week?

____ times a week ____ miles from home
____ times a week ____ miles from home
____ times a week ____ miles from home

Avoidance

13a. During the past 3 months, have you driven while it has been raining?

____ Yes (go to 13b)
____ No (go to 14)

13b. Would you say that you drive when it is raining with: (please check only one answer)

____ No difficulty at all
____ A little difficulty
____ Moderate difficulty
____ Extreme difficulty

14a. During the past 3 months, have you driven alone?

____ Yes (go to 14b)
____ No (go to 15)

14b. Would you say that you drive alone with: (check only one answer)

____ No difficulty at all
____ A little difficulty
____ Moderate difficulty
____ Extreme difficulty

15a. During the past 3 months, have you parallel parked?

____ Yes (go to 15b)
____ No (go to 15c)

15b. Would you say that you parallel park with: (check only one answer)

____ No difficulty at all
____ A little difficulty
____ Moderate difficulty
____ Extreme difficulty

15c. Why do you not parallel park?

____ Not necessary (not many parallel parking spots)
____ Visual problems
____ Never learned how
____ Other (specify) _____

- 16a. During the past 3 months, have you made left-hand turns across oncoming traffic?
____ Yes (go to 16b)
____ No (go to 17)
- 16b. Would you say that you make left-hand turns in traffic with: (check only one answer)
____ No difficulty at all
____ A little difficulty
____ Moderate difficulty
____ Extreme difficulty
- 17a. During the past 3 months, have you driven on interstates or expressways?
____ Yes (go to 17b)
____ No (go to 18)
- 17b. Would you say that you drive on interstates or expressways with: (check only one answer)
____ No difficulty at all
____ A little difficulty
____ Moderate difficulty
____ Extreme difficulty
- 18a. During the past 3 months, have you driven on high-traffic roads?
____ Yes (go to 18b)
____ No (go to 19)
- 18b. Would you say that you drive on high-traffic roads with: (check only one answer)
____ No difficulty at all
____ A little difficulty
____ Moderate difficulty
____ Extreme difficulty
- 19a. During the past 3 months, have you driven in rush hour traffic?
____ Yes (go to 19b)
____ No (go to 20)
- 19b. Would you say that you drive in rush hour traffic with: (check only one answer)
____ No difficulty at all
____ A little difficulty
____ Moderate difficulty
____ Extreme difficulty
- 20a. During the past 3 months, have you driven at night?
____ Yes (go to 20b)

____ No (go to 21)

20b. Would you say that you drive at night with: (check only one answer)

- ____ No difficulty at all
- ____ A little difficulty
- ____ Moderate difficulty
- ____ Extreme difficulty

Accidents and Citations

21. How many accidents have you been involved in over the past year when you were the driver? Please list the number of all accidents, whether or not you were at fault.

____ accidents

22. How many accidents have you been involved in over the past year when you were the driver where the police were called to the scene?

____ accidents

23. How many times over the past year have you been pulled over by the police, regardless of whether you received a ticket?

____ times

24. How many times in the past year have you received a traffic ticket (other than a parking ticket) where you were found to be guilty, regardless of whether or not you think you were at fault?

____ times

Driving Space

25. During the past year, have you driven in your immediate neighborhood?

____ Yes ____ No

26. During the past year, have you driven to places beyond your neighborhood?

____ Yes ____ No

27. During the past year, have you driven to neighboring towns?

____ Yes ____ No

28. During the past year, have you driven to more distant towns?

____ Yes ____ No

29. During the past year, have you driven to places outside the state where you live?

____ Yes ____ No

30. During the past year, have you driven to neighboring states?
____ Yes ____ No

Modified with permission from the Driving Habit Questionnaire (DHQ)

Owsley C, Stalvey B, Wells J, et al. Older drivers and cataracts: driving habits and crash risk. *J Gerontol: Med Sci.* 1999;54A:M203–M211.

Montreal Cognitive Assessment (MoCA)

Administration and Scoring Instructions

The Montreal Cognitive Assessment (MoCA) was designed as a rapid screening instrument for mild cognitive dysfunction. It assesses different cognitive domains: attention and concentration, executive functions, memory, language, visuoconstructional skills, conceptual thinking, calculations, and orientation. Time to administer the MoCA is approximately 10 minutes. The total possible score is 30 points; a score of 26 or above is considered normal.

1. **Alternating Trail Making:**

Administration: The examiner instructs the subject: *"Please draw a line, going from a number to a letter in ascending order. Begin here [point to (1)] and draw a line from 1 then to A then to 2 and so on. End here [point to (E)]."*

Scoring: Allocate one point if the subject successfully draws the following pattern: 1 –A- 2- B- 3- C- 4- D- 5- E, without drawing any lines that cross. Any error that is not immediately self-corrected earns a score of 0.

2. **Visuoconstructional Skills (Cube):**

Administration: The examiner gives the following instructions, pointing to the **cube**: *"Copy this drawing as accurately as you can, in the space below"*.

Scoring: One point is allocated for a correctly executed drawing.

- Drawing must be three-dimensional
- All lines are drawn
- No line is added
- Lines are relatively parallel and their length is similar (rectangular prisms are accepted)

A point is not assigned if any of the above-criteria are not met.

3. **Visuoconstructional Skills (Clock):**

Administration: Indicate the right third of the space and give the following instructions: *"Draw a **clock**. Put in all the numbers and set the time to 10 after 11"*.

Scoring: One point is allocated for each of the following three criteria:

- Contour (1 pt.): the clock face must be a circle with only minor distortion acceptable (e.g., slight imperfection on closing the circle);
- Numbers (1 pt.): all clock numbers must be present with no additional numbers; numbers must be in the correct order and placed in the approximate quadrants on the clock face; Roman numerals are acceptable; numbers can be placed outside the circle contour;
- Hands (1 pt.): there must be two hands jointly indicating the correct time; the hour hand must be clearly shorter than the minute hand; hands must be centred within the clock face with their junction close to the clock centre.

A point is not assigned for a given element if any of the above-criteria are not met.

4. **Naming:**

Administration: Beginning on the left, point to each figure and say: *“Tell me the name of this animal”*.

Scoring: One point each is given for the following responses: (1) camel or dromedary, (2) lion, (3) rhinoceros or rhino.

5. **Memory:**

Administration: The examiner reads a list of 5 words at a rate of one per second, giving the following instructions: *“This is a memory test. I am going to read a list of words that you will have to remember now and later on. Listen carefully. When I am through, tell me as many words as you can remember. It doesn’t matter in what order you say them”*. Mark a check in the allocated space for each word the subject produces on this first trial. When the subject indicates that (s)he has finished (has recalled all words), or can recall no more words, read the list a second time with the following instructions: *“I am going to read the same list for a second time. Try to remember and tell me as many words as you can, including words you said the first time.”* Put a check in the allocated space for each word the subject recalls after the second trial.

At the end of the second trial, inform the subject that (s)he will be asked to recall these words again by saying, *“I will ask you to recall those words again at the end of the test.”*

Scoring: No points are given for Trials One and Two.

6. **Attention:**

Forward Digit Span: Administration: Give the following instruction: *“I am going to say some numbers and when I am through, repeat them to me exactly as I said them”*. Read the five number sequence at a rate of one digit per second.

Backward Digit Span: Administration: Give the following instruction: *“Now I am going to say some more numbers, but when I am through you must repeat them to me in the backwards order.”* Read the three number sequence at a rate of one digit per second.

Scoring: Allocate one point for each sequence correctly repeated, (*N.B.*: the correct response for the backwards trial is 2-4-7).

Vigilance: Administration: The examiner reads the list of letters at a rate of one per second, after giving the following instruction: *“I am going to read a sequence of letters. Every time I say the letter A, tap your hand once. If I say a different letter, do not tap your hand”*.

Scoring: Give one point if there is zero to one errors (an error is a tap on a wrong letter or a failure to tap on letter A).

Serial 7s: Administration: The examiner gives the following instruction: “Now, I will ask you to count by subtracting seven from 100, and then, keep subtracting seven from your answer until I tell you to stop.” Give this instruction twice if necessary.

Scoring: This item is scored out of 3 points. Give no (0) points for no correct subtractions, 1 point for one correction subtraction, 2 points for two-to-three correct subtractions, and 3 points if the participant successfully makes four or five correct subtractions. Count each correct subtraction of 7 beginning at 100. Each subtraction is evaluated independently; that is, if the participant responds with an incorrect number but continues to correctly subtract 7 from it, give a point for each correct subtraction. For example, a participant may respond “92 – 85 – 78 – 71 – 64” where the “92” is incorrect, but all subsequent numbers are subtracted correctly. This is one error and the item would be given a score of 3.

7. **Sentence repetition:**

Administration: The examiner gives the following instructions: “I am going to read you a sentence. Repeat it after me, exactly as I say it [pause]: ***I only know that John is the one to help today.***” Following the response, say: “Now I am going to read you another sentence. Repeat it after me, exactly as I say it [pause]: ***The cat always hid under the couch when dogs were in the room.***”

Scoring: Allocate 1 point for each sentence correctly repeated. Repetition must be exact. Be alert for errors that are omissions (e.g., omitting “only”, “always”) and substitutions/additions (e.g., “John is the one who helped today;” substituting “hides” for “hid”, altering plurals, etc.).

8. **Verbal fluency:**

Administration: The examiner gives the following instruction: “Tell me as many words as you can think of that begin with a certain letter of the alphabet that I will tell you in a moment. You can say any kind of word you want, except for proper nouns (like Bob or Boston), numbers, or words that begin with the same sound but have a different suffix, for example, love, lover, loving. I will tell you to stop after one minute. Are you ready? [Pause] Now, tell me as many words as you can think of that begin with the letter F. [time for 60 sec]. Stop.”

Scoring: Allocate one point if the subject generates 11 words or more in 60 sec. Record the subject’s response in the bottom or side margins.

9. **Abstraction:**

Administration: The examiner asks the subject to explain what each pair of words has in common, starting with the example: “Tell me how an orange and a banana are alike”. If the subject answers in a concrete manner, then say only one additional time: “Tell me another way in which those items are alike”. If the subject does not give the appropriate response (*fruit*), say, “Yes, and they are also both fruit.” Do not give any additional instructions or clarification.

After the practice trial, say: “Now, tell me how a train and a bicycle are alike”. Following the response, administer the second trial, saying: “Now tell me how a ruler and a watch are alike”. Do not give any additional instructions or prompts.

Scoring: Only the last two item pairs are scored. Give 1 point to each item pair correctly answered. The following responses are acceptable:

Train-bicycle = means of transportation, means of travelling, you take trips in both;

Ruler-watch = measuring instruments, used to measure.

The following responses are **not** acceptable: Train-bicycle = they have wheels; Ruler-watch = they have numbers.

10. Delayed recall:

Administration: The examiner gives the following instruction: *“I read some words to you earlier, which I asked you to remember. Tell me as many of those words as you can remember. Make a check mark (✓) for each of the words correctly recalled spontaneously without any cues, in the allocated space.*

Scoring: **Allocate 1 point for each word recalled freely without any cues.**

Optional:

Following the delayed free recall trial, prompt the subject with the semantic category cue provided below for any word not recalled. Make a check mark (✓) in the allocated space if the subject remembered the word with the help of a category or multiple-choice cue. Prompt all non-recalled words in this manner. If the subject does not recall the word after the category cue, give him/her a multiple choice trial, using the following example instruction, *“Which of the following words do you think it was, NOSE, FACE, or HAND?”*

Use the following category and/or multiple-choice cues for each word, when appropriate:

FACE: category cue: part of the body multiple choice: nose, face, hand

VELVET: category cue: type of fabric multiple choice: denim, cotton, velvet

CHURCH: category cue: type of building multiple choice: church, school, hospital

DAISY: category cue: type of flower multiple choice: rose, daisy, tulip

RED: category cue: a colour multiple choice: red, blue, green

Scoring: **No points are allocated for words recalled with a cue.** A cue is used for clinical information purposes only and can give the test interpreter additional information about the type of memory disorder. For memory deficits due to retrieval failures, performance can be improved with a cue. For memory deficits due to encoding failures, performance does not improve with a cue.

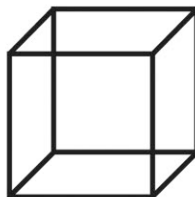
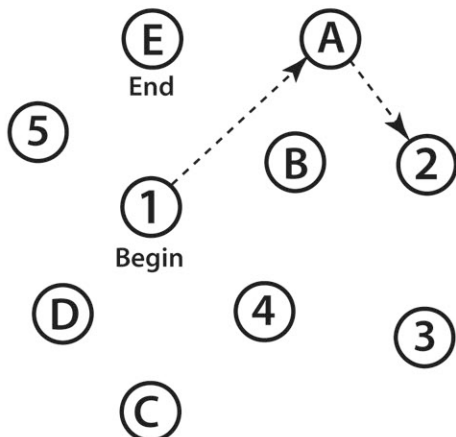
11. Orientation:

Administration: The examiner gives the following instructions: *“Tell me the date today”. If the subject does not give a complete answer, then prompt accordingly by saying: “Tell me the [year, month, exact date, and day of the week].” Then say: “Now, tell me the name of this place, and which city it is in.”*

Scoring: Give one point for each item correctly answered. The subject must tell the exact date and the exact place (name of hospital, clinic, office). No points are allocated if subject makes an error of one day for the day and date.

TOTAL SCORE: Sum all subscores listed on the right-hand side. Add one point for an individual who has 12 years or fewer of formal education, for a possible maximum of 30 points. A final total score of 26 and above is considered normal.

VISUOSPATIAL / EXECUTIVE



Copy
cube

Draw CLOCK (Ten past eleven)
(3 points)

POINTS

[]

[]

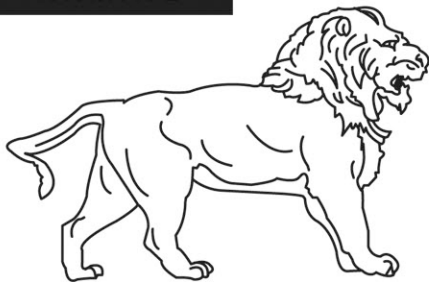
[]
Contour

[]
Numbers

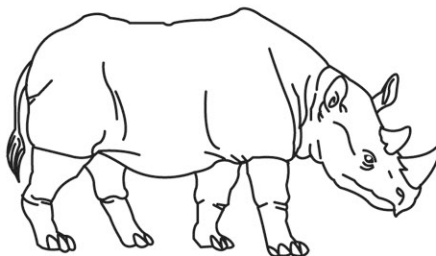
[]
Hands

___/5

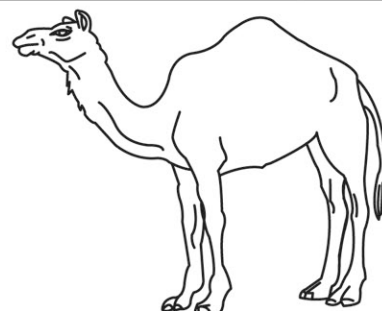
NAMING



[]



[]



[]

___/3

MEMORY

Read list of words, subject must repeat them. Do 2 trials, even if 1st trial is successful. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAISY	RED
1st trial					
2nd trial					

No
points

ATTENTION

Read list of digits (1 digit/ sec.).

Subject has to repeat them in the forward order

[] 2 1 8 5 4

Subject has to repeat them in the backward order

[] 7 4 2

___/2

Read list of letters. The subject must tap with his hand at each letter A. No points if ≥ 2 errors

[] FBACMNAAJKLBAFAKDEAAAJAMOF AAB

___/1

Serial 7 subtraction starting at 100

[] 93

[] 86

[] 79

[] 72

[] 65

4 or 5 correct subtractions: **3 pts**, 2 or 3 correct: **2 pts**, 1 correct: **1 pt**, 0 correct: **0 pt**

___/3

LANGUAGE

Repeat : I only know that John is the one to help today. []

The cat always hid under the couch when dogs were in the room. []

___/2

Fluency / Name maximum number of words in one minute that begin with the letter F

[] _____ (N ≥ 11 words)

___/1

ABSTRACTION

Similarity between e.g. banana - orange = fruit

[] train - bicycle

[] watch - ruler

___/2

DELAYED RECALL

Has to recall words

WITH NO CUE

FACE

[]

VELVET

[]

CHURCH

[]

DAISY

[]

RED

[]

Points for
UNCUED
recall only

___/5

Optional

Category cue

Multiple choice cue

ORIENTATION

[] Date

[] Month

[] Year

[] Day

[] Place

[] City

___/6

Adaptive Equipment to Compensate for Impairments in Motor Performance

Category I: “Gadgets” that may assist mobility, comfort in the vehicle, or visibility

- The adaptive devices in this category are available via websites, catalogs or in stores carrying automotive devices.
- To be in this category they do not directly interfere/alter the control of a moving vehicle.
- Items in this category do not require a Comprehensive Driving Evaluation and/or a prescription from a driving rehabilitation specialist

A. Handybar® (transfers, driver or passengers)

1. Much like an arm on an armchair, this tool can be helpful for drivers, passengers and caregivers. It may reduce the work/stress on the person assisting with ingress/egress from a vehicle.
2. Precautions/concerns/limitation:
 - a. There are several manufacturers and styles. The “blade” style may be too wide to fit in some vehicle models.
 - b. Some advertises the additional utility to break windows and cut the seatbelt.
 - c. The device cannot be left in place; therefore it requires a convenient (in reach) and safe location for storage.

B. Ribbon or seatbelt Easy Reach Handle® (reach the seatbelt)

1. An option when reaching for the seatbelt is painful or difficult (particularly if this is a reason the seatbelt is not worn).
2. A piece of ribbon may be sufficient or they can purchase a gadget such as the “easy reach” adaptive device that attaches to the seatbelt.
3. Precautions/concerns/limitations:
 - a. Warn that any device must not interfere with the seatbelt in any manner. Closely note the placement and avoid any possible interference with the seatbelts function to freely retraction and feed.

C. Plastic garbage bag or seat slide (transfers)

1. Plastic garbage bag is an inexpensive assist to sliding into place. (Commercially available products such as the seat slide are also available).
2. This can also be a useful as a caregiver resource.
3. Precautions/concerns/limitations:
 - a. Once in the seat the bag creates a slippery surface. Recommend that it be removed when vehicle is in motion.

D. Leg lifter (transfers, pivot into the seat)

1. A loop is placed over foot to assist in “lifting leg” into the vehicle.
2. Manually show how to assist pulling leg into vehicle by pulling onto pant leg or lifting thigh.

E. Key holder (decrease pain/trauma with turning key)

1. Generally inexpensive and available in various styles and designs.
2. Precautions/concerns/limitations:
 - a. Consider placement of ignition and be sure the key holder does not interfere

Category II: Devices readily available but may interfere with vehicle safety devices.

- Consumers need to be well informed of the pros and cons when choosing to use devices in this category.
- There are no current “guidelines”. Referral to an occupational therapist or driving rehabilitation specialist may be justified for offering guidance in this purchase.

A. Wedge cushion (seat height to raise line of sight, check impact on reach to pedals)

1. Variables include the quality of foam (firm, stable) and shape. Determining the benefit of the shape, wedge or block style cushion, will depend on the person’s needs and the contours of the vehicle seat.
2. Precautions/concerns/limitations: Any cushion may impact the ability to reach the pedals. It may contribute to “submarining”: under the lap belt in the event of a crash.

B. Mirrors (adjustment, additional side and rearview (panoramic))

1. Many versions of clip on and stick on mirrors are available to expand the peripheral field of view for the driver. For some drivers they work, for others they may distort or distract.
2. Precautions/concerns/limitations: a mirror clipped to the rearview mirror may become a projectile in a crash.

C. Pedal Extenders (built up pedals for short statured drivers)

1. Many versions. Professional installation important for proper placement and secure attachment.
2. Lack of consensus if this equipment should require a driving evaluation and prescription.

Category III: Adaptive Equipment requiring evaluation, prescription and professional installation

- Explore a full array of equipment options at The National Mobility Equipment Dealer’s Association www.nmeda.com
- The Comprehensive Driving Evaluation should provide an evaluation of the senior driver, individualized recommendations and equipment prescriptions. This evaluation should be neutral to vendor and equipment brands.
- Adaptive equipment does interfere with the Original Equipment Manufacturer (OEM) and must be properly installed, inspected, and the driver trained in its use. (NMEDA)
- Many states require testing and place a restriction on the driver’s license

A. Steering Knob (drive with one hand/arm)

1. Evaluation determines ideal placement of this device on the steering wheel.

2. Some states require this adaptation for one-handed drivers

B. Left Foot Accelerator (manage gas with left foot when right foot unable/unreliable)

1. Requires comprehensive evaluation, professional installation and training.
2. Requires new learning, evaluation of cognition is essential.
3. Controversial. Some programs no longer install, yet many have used very successfully.

C. Hand Controls (control gas and brake with hands, nonfunctioning or unreliable lower extremities)

1. Requires comprehensive evaluation, professional installation and training.
2. Requires new learning, evaluation of cognition is essential.
3. Many configurations are available, matching the hand control model with the driver's strongest abilities and the access allowed by the model of vehicle is essential.

D. A wide range of specialized devices are available for primary (low effort steering, smaller circumference steering wheel) and secondary controls (blinker, wipers, etc.). Drivers experiencing pain, impaired reach, diminished strength may benefit from modifications that bring control of the vehicle within their physical capabilities.

1. The Comprehensive Driving Evaluation will provide an evaluation of the senior driver, individualized recommendations and equipment prescriptions. This evaluation should be neutral to vendor and equipment brands.
2. Adaptive equipment does not interfere with the Original Equipment Manufacturer (OEM) and must be properly installed, inspected, and the driver trained in its use. (NMEDA)
3. Many states require testing and place a restriction on the driver's license
4. Equipment and installation is costly. Refer to the driving evaluator with medical background and trained to understand the medical condition and its progression.

Category IV: Vehicle Modification requiring evaluation, prescription and professional installation

- The Comprehensive Driving Evaluation is likely required to prescribe the complex components of vehicle modification. This evaluation should be neutral to vendor and equipment brands.
- Modification clearly interferes with the OEM design and should only be completed by certified vehicle modifiers. See www.NMEDA.com.
- Many states require testing and will place a restriction on the driver's license for driver of a modified vehicle.
- Caregiver needs must be considered when discharging a senior with medical conditions that impact mobility.
- Equipment and installation is costly. Refer to the driving evaluator with medical background and trained to understand the medical condition and its progression.

A. Vehicle adaption may include wider doors, lowered floor for wheelchair access, or a proper securement system if driving from the wheelchair. Modifications to the vehicle to allow driver to transfer and stow of equipment.

B. Vehicle adaptation may consider both the needs of the client and caregiver. When the senior is now a passenger only, the caregivers may benefit from an adapted vehicle that supports successful transfers and transport of their mobility equipment with attention to the physical burden on the caregiver.

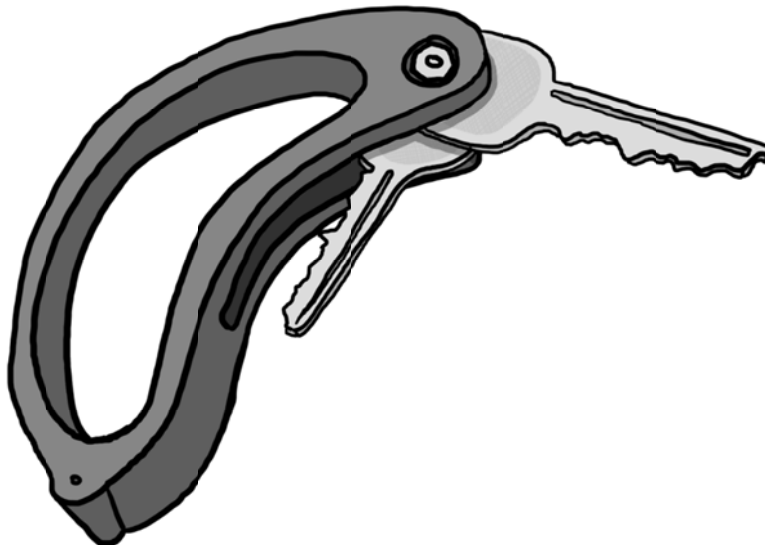
C. Transporting mobility equipment such as wheelchairs and scooters may be difficult. Some vehicles lack the space and access. Some scooter designs fold and lift easier than others. Some trailer style carriers may be too heavy for the vehicle, potentially interfering with vehicle function and control.

Resources

1. **Handybar (transfers, driver or passengers)**
 - <http://www.handybar.com/> around \$40
2. **Ribbon or seatbelt Easy Reach Handle (reach the seatbelt)**
 - http://www.shop.com/op/~Easy_Reach_Seatbelt-prod-12550917 around \$8.00
3. **Wedge cushion (seat height)**
 - http://www.asseenontv.com/prod-pages/seat_solution.html
 - Purchase at Bed, Bath and Beyond for under \$20
 - Other foam qualities and styles may be \$50 to \$100
4. **Mirrors (instructions re: “how to adjust” is adequate)**
 - <http://www.drivingcomfort.com/index.cfm/fa/p/pid/183/sc/7543>
 - Use your professional judgment if choosing to have sample mirrors. Some are concerned that interior mirrors could break loose in a crash. Training is essential to benefit from ancillary mirrors.
5. **Garbage bag or seat slide (transfers)**
 - <http://www.abledata.com/abledata.cfm?pageid=19327&top=13902&productid=78954&trail=0>
 - Seat Slide approximately \$100.00
 - garbage bag or silky scarf (nominal)
6. **Leg lifter (transfers)**
 - <http://www.dynamic-living.com/leg-lifter.htm> (under \$15.00)
7. **Adjustable (built up) Key holder (decrease pain/trauma with turning key)**
 - Several style choices (prices range \$8.00 to \$15.00) available at http://www.sammonspreston.com/Supply/Product.asp?Leaf_Id=6513



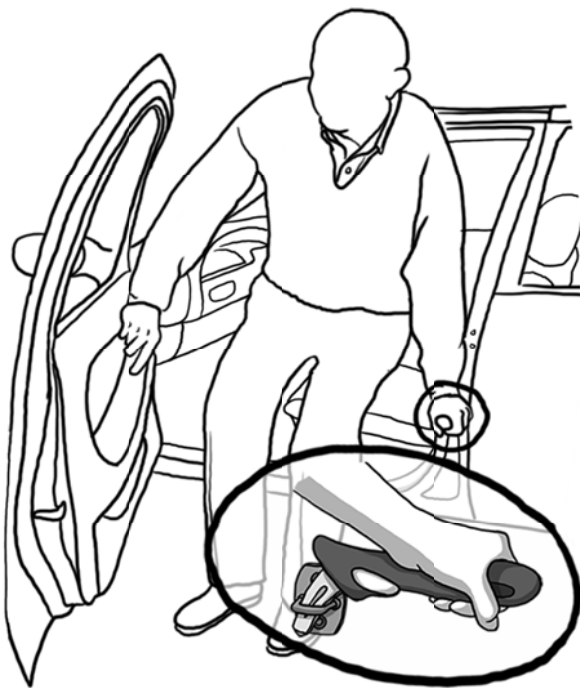
Leg Lifter



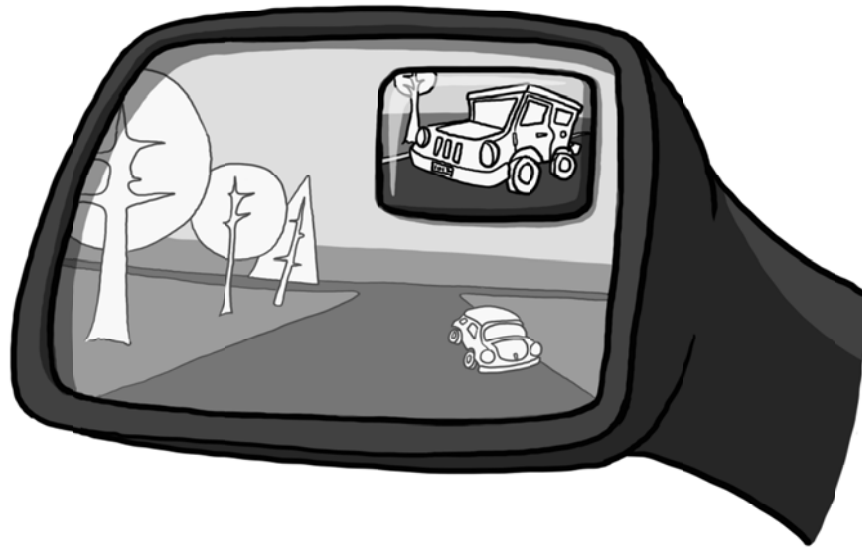
Key Holder



Easy Reach



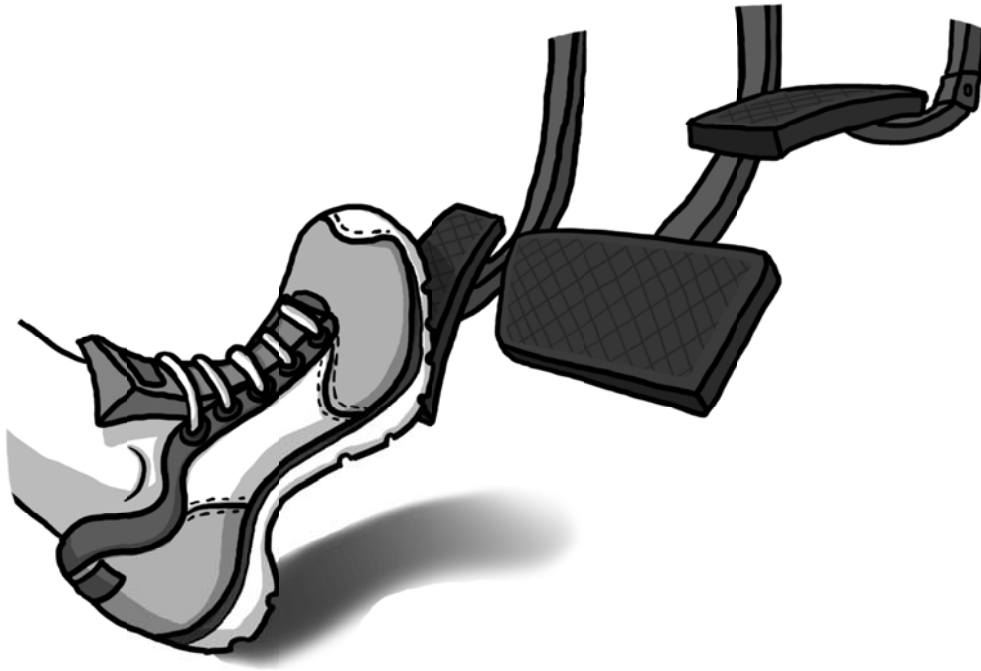
Handy Bar



Button Mirror



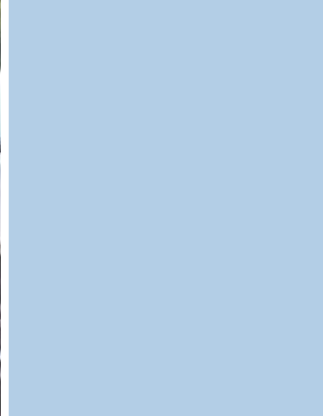
Pedal Extender



Left Foot Accelerator



Steering Knob



National Highway Traffic Safety Administration

Adapting Motor Vehicles for Older Drivers

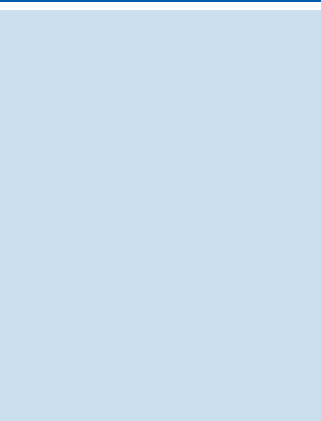


Table of Contents

Introduction	1
Investigate Cost-Saving Opportunities and Licensing Requirements	2
Evaluate Your Needs	4
Select the Right Vehicle	6
Choose a Qualified Mobility Dealer to Modify Your Vehicle	8
Obtain Training on the Use of New Equipment	10
Maintain Your Vehicle	11
Resources	12

Introduction

A Proven Process for Maintaining Freedom on the Road

New and existing adaptive technologies continue to broaden opportunities for older drivers to drive comfortably and safely — and enjoy the freedom of driving for as long as possible. Some of these adaptive technologies are as simple as swivel seats for more convenient access. Others, such as hand controls, may be necessary for a driver to safely operate a vehicle. All drivers who are facing, or may soon face, age-related driving challenges should become familiar with the technologies available to support any special driving needs.

The information in this brochure is based on the experience of driver rehabilitation specialists and other professionals who work with people who require adaptive devices for their motor vehicles. The

steps outlined here represent a proven process — **evaluating your needs, making sure the vehicle “fits” you properly, choosing appropriate features, installing and knowing how to use adaptive devices, practicing good vehicle maintenance** — that can help you avoid costly mistakes when modifying or purchasing a vehicle to accommodate age-related changes that may affect your driving.

Also included is general information on cost savings, licensing requirements, and organizations to contact for additional assistance. Although the brochure focuses on drivers of modified vehicles, each section also contains important information for people who provide transportation for passengers with special needs.

Investigate Cost-Saving Opportunities and Licensing Requirements

Cost-Saving Opportunities

With such a wide range of adaptive equipment solutions available, associated costs for modifying a vehicle can vary greatly depending on an individual's needs. Some adaptive equipment, such as a special seat-back cushion, can provide a better view of the road for as little as \$50. More complex equipment, such as hand controls, can be purchased for under \$1,000. However, a new vehicle modified with adaptive equipment will cost anywhere from \$20,000 to \$80,000.

Whether you are modifying a vehicle you now own or purchasing a new vehicle with adaptive equipment, it pays to do your homework first. By consulting with a driver rehabilitation specialist before you buy, you can learn what adaptive equipment you need now or may need in the future, avoid paying for equipment you don't need, and learn about opportunities for public and private financial assistance.

There are programs that may help pay part or all of the cost of vehicle modification. For information, contact your State's Department of Vocational Rehabilitation or another agency that provides vocational services, and, if appropriate, the U.S. Department of Veterans Affairs. You can find phone numbers for these State and Federal agencies in your local phone book.

Also be aware of the following:

- Some nonprofits that advocate for individuals with disabilities offer programs that may help pay for adaptive devices. Generally, these groups and programs represent local resources. To learn about any available programs in your area, contact your State government office that handles services for persons with disabilities.
- Automotive insurance may cover all or part of the cost of adaptive equipment if your need for such equipment is a result of a motor vehicle crash.
- Workers' compensation typically covers the cost of adaptive equipment if your need for such equipment is a result of a job-related injury.

- Most major vehicle manufacturers offer rebates on adaptive equipment, usually up to \$1,000, provided you purchase a vehicle less than one year old. Your local automobile dealer can supply information on these programs and assist you with the application process. Contact information for vehicle manufacturers offering rebates on adaptive equipment is listed in the "Resources" section of this brochure.
- National Mobility Equipment Dealers Association (NMEDA) members are also familiar with vehicle manufacturer rebates, can help you apply for these rebates — and can provide pre-purchase advice about the type of vehicle that will accommodate your adaptive equipment needs. NMEDA contact information is listed in the "Resources" section of this brochure.
- Some States waive the sales tax for adaptive devices if you have a doctor's prescription for their use.
- The cost of adaptive equipment may be tax deductible. Check with a qualified tax consultant to learn more.

Licensing Requirements

All States require a valid learner's permit or driver's license to receive an on-the-road driving evaluation. You cannot be denied the opportunity to apply for a permit or license because of age or disability. However, a driver's license with restrictions may be issued based on your need of adaptive equipment.

Evaluate Your Needs

Driver rehabilitation specialists perform comprehensive evaluations to identify the adaptive equipment most suited to your needs and medical condition. As part of this process, a rehabilitation specialist will take into consideration your future equipment needs based on your medical condition and the repetitive stress an adaptive aid may place on a particular muscle group.

In addition, you can expect a complete evaluation to include vision screening as well as:

- Muscle strength, flexibility, and range of motion;
- Coordination and reaction time;
- Judgment and decision-making abilities; and
- Ability to drive with adaptive equipment.

After you finish the evaluation you should receive a report containing specific recommendations on driving requirements or restrictions. You should also be given a complete list of any recommended vehicle requirements or modifications. The recommendations should suggest obtaining on-the-road training to practice safe operation of the equipment and learn safe driving habits.

Finding a Qualified Driver Rehabilitation Specialist

Check with a rehabilitation center in your area to find a qualified driver rehabilitation specialist to perform your evaluation. You'll find rehabilitation centers for each State listed on the Web sites for the Association for Driver Rehabilitation Specialists (ADED) and the American Occupational Therapy Association, Inc. (AOTA). These associations maintain lists of qualified driver rehabilitation specialists in areas across the United States and Canada. Contact information for these groups is located in the "Resources" section of this brochure.



Paying for an Evaluation

- Vocational rehabilitation agencies and workers' compensation agencies may assist in the cost of a driver evaluation.
- Your health insurance company may pay for part or all of the evaluation. Find out from your insurance company if you need a doctor's prescription or other documentation to receive such benefits.
- Many driver evaluation programs offer senior drivers a discount on evaluations. Ask if your driver rehabilitation specialist offers a discount to seniors.

Determining the Best Time to Seek a Driving Evaluation

Consult with your doctor to make sure you are physically and psychologically prepared to drive. Being evaluated too soon after an injury, stroke, or other trauma may be misleading because it may show the need for adaptive equipment that you will not need in the future. You want to be functioning at your best when you have a driver evaluation. For the evaluation, you will need to take any equipment you normally use, such as a walker or neck brace. If you use a wheelchair and are planning to modify

the wheelchair or obtain a new one, be sure to tell your driver rehabilitation specialist prior to the evaluation.

Evaluating Passengers with Disabilities

Driver rehabilitation specialists may also give advice on compatibility and transportation safety issues for passengers with special needs. They determine the type of seating needed and the person's ability to enter and exit the vehicle. They provide advice on the purchase of modified vehicles and recommend appropriate wheelchair lifts or other equipment that would work in your vehicle.



Select the Right Vehicle

Although the purchase or lease of a vehicle is your responsibility, your mobility equipment dealer and driver rehabilitation specialist are qualified to ensure the vehicle you select can be modified to meet your adaptive equipment needs. Take the time to consult with these professionals before you make your purchase decision.

To find a qualified dealer in your area, contact the National Mobility Equipment Dealers Association (NMEDA). To find a qualified driver rehabilitation specialist, contact the Association for Driver Rehabilitation Specialists (ADED). Complete contact information for these two organizations is listed in the “Resources” section of this brochure.

The following questions can help with vehicle selection. They can also help determine if you can modify a vehicle you already own:

- Does the vehicle have the cargo capacity (in pounds) to accommodate the equipment you require?
- Will there be enough space and cargo capacity to accommodate your family or other passengers once the vehicle is modified?
- Is there adequate parking space at home and at work for the vehicle and for loading/unloading a wheelchair?
- Is there adequate parking space to maneuver if you use a walker?
- What additional options are necessary for the safe operation of the vehicle?

If a third party is paying for the vehicle, adaptive devices, or modification costs, find out if there are any limitations or restrictions on what is covered. Always get a written statement on what a funding agency will pay before making your purchase.

Once you select and purchase a vehicle, be aware that you will need to also purchase insurance to cover your vehicle while it's being modified — even though it will be off the road during this period.

Standard Features to Look for in a New Passenger Vehicle

Before purchasing a new vehicle, always sit in it first to make sure you are comfortable. Check to see that you can enter and exit the vehicle with ease. If possible, take it out for a test drive. How well does the car fit your body? To prevent air bag-related injury, you should keep 10 inches between your breast bone and the steering wheel, which contains

the driver's side air bag. At the same time, you'll need to be able to easily reach the pedals while maintaining a comfortable line of sight above the adjusted steering wheel. Also, make sure the vehicle provides you with good visibility in all directions — front, rear, and sides. Your dealer can demonstrate the use of adaptive features, such as adjustable foot pedals and driver seats, which can help ensure a good person-vehicle fit.

Check to see if the model you are considering purchasing has good crash test results and is resistant to rollover. Visit www.safercar.gov or call the Vehicle Safety Hotline at **888-327-4236** to obtain government crash test results and rollover ratings for specific makes and models.

When selecting a vehicle, look for and ask about available features designed to improve both the comfort and safety of drivers experiencing physical or visual challenges associated with aging. Some of these features are:

- High or extra-wide doors;
- Adjustable foot pedals;
- Large interior door handles;

- Oversized knobs with clearly visible labels;
- Support handles to assist with entry and exit;
- Large or adjustable-size print for dashboard gauges;
- Seat adjusters that can move the seat in all directions — particularly raising it so the driver's line of sight is 3" above the *adjusted* steering wheel; and
- Dashboard-mounted ignition rather than steering column-mounted ignition.



Choose a Qualified Mobility Dealer to Modify Your Vehicle

Even a half inch change in the lowering of a van floor can affect a driver's ability to use equipment or to have an unobstructed view of the road. So it's important that you take the time to find a qualified dealer to modify your vehicle. Your driver rehabilitation specialist may be able to provide referrals depending on where you live and your vehicle modification and adaptive equipment needs.

Note: Some State agencies specify the dealer you must use if you want reimbursement. For example, some States require that dealers bidding on State vocational rehabilitation jobs be members of the National Mobility Equipment Dealer's (NMEDA's) Quality Assurance Program. You'll find contact information for NMEDA within the "Resources" section of this brochure.

To find qualified mobility equipment dealers, begin with phone inquiries to learn about credentials, experience, and references. Ask questions about how they operate. Do they work with qualified driver rehabilitation specialists? Will they look at your vehicle before you buy it? Do they require a prescription from a physician or driver evaluation specialist? How long will it take before they can start work on your vehicle?

Also ensure that the dealer you choose to modify your vehicle is registered with the National Highway Traffic Safety Administration (NHTSA). In order to adapt a vehicle to meet your needs, registered equipment dealers are permitted to modify existing federally mandated safety equipment. In addition, registered mobility equipment dealers must provide you with a written statement regarding the work that was performed, as well as list any Federal Motor Vehicle Safety Standards affected by their modification work on a label adjacent to the original equipment manufacturer's label or the modifier's certification label. These labels are often found inside the driver's door. Visit www.nhtsa.dot.gov/cars/rules/adaptive/Modifier/Index.cfm to find out if a mobility equipment dealer is registered with NHTSA as a vehicle modifier.

Questions to consider in evaluating a mobility equipment dealer's qualifications are listed below:

- Is the dealer registered with NHTSA?
- Is the dealer a member of NMEDA — and a participant in this organization's **Quality Assurance Program**?
- What type of training has the staff received?

- What type of warranty is provided on work?
- Does the dealer provide ongoing service and maintenance?
- Are replacement parts stocked and readily available?

If you are satisfied with the answers you receive, check references; then arrange to visit the dealer's facility. Once you are comfortable with a dealer's qualifications, you will want to ask more specific questions, such as:

- How much will the modification cost?
- Are third-party payments accepted?
- How long will it take to modify the vehicle?

- Can the equipment be transferred to a new vehicle in the future?
- Will existing safety features need to be modified to install the adaptive equipment?

While your vehicle is being modified, you will most likely need to be available for fittings. This avoids additional waiting time for adjustments once the equipment is fully installed. Without proper fittings you may have problems with the safe operation of the vehicle and have to go back for adjustments.



Obtain Training on the Use of New Equipment

Both new and experienced drivers need training on how to safely use newly installed adaptive equipment. Your equipment installer and driver rehabilitation specialist should provide information on the new devices and off-road instruction.

But literature and off-road instruction aren't enough to equip you to drive safely with your new adaptive equipment. This equipment can be very complex. So it's extremely important to obtain on-the-road training and practice with a driver rehabilitation specialist who has advanced expertise and knowledge of adaptive technologies. If your driver rehabilitation specialist does not offer such training, ask him or her for a referral, or inquire at your local driver licensing office.

State vocational rehabilitation departments and workers' compensation plans will pay for driver education and training under certain circumstances. At a minimum, their staffs can help you locate a qualified driver rehabilitation specialist to provide training.

Finally, remember to enlist the help of a family member or friend to drive you to all of your training sessions. (It's important to have someone else who can drive your vehicle in case of an emergency.)

Ensuring Safe Operation and Warranty Compliance

Regular maintenance is important for keeping your vehicle and specially installed adaptive features safe and reliable. It may also be mandatory for compliance with the terms of your warranty. Some warranties specify a time period during which adaptive equipment must be inspected. These equipment check-up schedules may differ from those for your vehicle. Make sure you or your modifier submit all warranty cards for all equipment. This will not only ensure coverage, but will also enable manufacturers to contact you in case of a recall.



Maintain Your Vehicle

Vehicle Safety Checklist

Your vehicle warranty and owner's manual will describe regularly required vehicle maintenance. Keep in mind that your adaptive equipment may need special attention or more frequent check-ups than your vehicle alone. However, the following checklist represents basic maintenance that applies to all vehicles:

- Check tire pressure at least once a month and always before a long road trip.
- Change oil as recommended by your owner's manual, using the grade recommended.
- Check all fluids when you change the oil, including power steering fluid, brake fluid, and engine coolant.
- Routinely check headlights, brake and parking lights, reverse lights, and turn signals.

- Remember to keep your windows and headlights clean. You need to clearly see where you are going. Keeping the headlights clean will help other cars see you too.
- Check for damage from road hazards by having your vehicle put on a service lift at least once a year.

Proper maintenance can keep your vehicle running smoothly, leaving you free to concentrate on the road and enjoy the freedom of driving.

Resources

Association for Driver Rehabilitation Specialists (ADED)

711 S. Vienna Street
Ruston, LA 71270
800-290-2344
www.aded.net

American Occupational Therapy Association (AOTA)

4720 Montgomery Lane
P.O. Box 31220
Bethesda, MD 20824-1220
301-652-2682
TDD: 800-377-8555
www.aota.org/olderdriver

National Mobility Equipment Dealers Association (NMEDA)

3327 West Bearss Avenue
Tampa, FL 33618
800-833-0427
www.nmeda.org

National Highway Traffic Safety Administration (NHTSA)

1200 New Jersey Avenue SE.
Washington, DC 20590
888-327-4236
TDD: 800-424-9153
www.nhtsa.gov
www.safercar.gov

Department of Veteran Affairs

800-827-1000
www.va.gov

State Departments of Vocational Rehabilitation

Listed in telephone book.

The following manufacturers offer rebates or reimbursements on new-vehicle modification.

Audi

800-822-2834
www.audiusa.com

DaimlerChrysler Corporation

800-255-9877
(TDD Users: 800-922-3826)
www.daimlerchrysler.com

Ford Motor Company

800-952-2248
(TDD Users: 800-TDD-0312)
www.fordmobilitymotoring.com

General Motors Corporation

800-323-9935
(TDD Users: 800-TDD-9935)
www.gm.com

Saturn

800-553-6000, Prompt 3
(TDD Users: 800-833-6000)
www.saturn.com

Toyota

800-331-4331
www.toyota.com/mobility

Volkswagen

800-822-8987
www.vw.com

Selected photos courtesy of Bruno Independent Living Aids.





Sample Driving Cessation Plan

Planning for future driving cessation requires research and planning similar to future needs for finances and housing. Ideally, creating a driving cessation plan starts early, years before driving needs to stop. Having individual choice and control over transportation options means knowing what options are available and how to use them.

One concept many older adults find helpful is “transition”. This involves gaining experience and confidence in the use of several forms of transportation options available in the community. This planning may also involve exploring requirements for eligibility, availability, routes, and accessibility.

When driving needs to stop for medically-related changes, transportation options may need to include support to allow an individual to move from one destination to another safely. The growing field of Mobility Management may be an option available in your community. Mobility Managers assist individuals and their families with creating transportation plans with appropriate supports for safety and comfort. An example of support may be a service offering door to door service or the provision of an escort who comes to the older adult’s door, to and from the vehicle and stays with them at their destination until returning safely back into their home.

Sample Driving Cessation Plan for _____:

- 1) You are experiencing medically related changes that may require you to stop driving at some point in the future. Your physician or medical professional will assist you in monitoring these changes and will do everything possible to extend driving as long as safely possible.
- 2) We recommend that you make a list of the typical places you go. This list will guide you in your exploration of options other than driving that can support ongoing participation in the activities you choose.
- 3) Frequent locations:
 - a. Grocery
 - b. Drugstore
 - c. Bank
 - d. Post office
 - e. Senior Center
 - f. Exercise/physical activity facility

- g. Outdoor park
 - h. Library
 - i. Medical office(s)
 - j. Dental office(s)
 - k. Personal care (hairstylist, barber shop, nail care, etc)
 - l. General shopping (mall, discount store, etc)
 - m. Entertainment venue (concerts, performances, movie theater, etc)
 - n. Club activities (card-playing, garden, bingo, community service, etc)
 - o. Volunteer service locations (food pantry, homeless shelter, etc)
- 4) Explore your personal options. Who might provide a ride, and for which of the destinations from your list?
- a. Family
 - b. Neighbors
 - c. Friends
 - d. Others participating in the same activity
- 5) Become experienced with the transportation options available so you can decide which you prefer and for what destinations.
- a. Public transportation--local bus and train routes
 - b. The medical/para transit system
 - c. Taxi cabs
 - d. Volunteer driver programs
 - e. Other transportation providers
 - f. For assistance contact your Area Agency on Aging, ask about Mobility Management, contact a social worker or senior center.

Resources:

1. Administration for Community Living State/Area Agency on Aging Finder. Available at http://aoa.gov/AoA_programs/OAA/How_To_Find/Agencies/find_agencies.aspx. Accessed July 17, 2015.
2. Area Agency on Aging Eldercare Locator. Available at www.eldercare.gov. Accessed July 17, 2015.

Snellen Test

E

1 20/200

F P

2 20/100

T O Z

3 20/70

L P E D

4 20/50

P E C F D

5 20/40

E D F C Z P

6 20/30

F E L O P Z D

7 20/25

D E F P O T E C

8 20/20

L E F O D P C T

9

F D P L T C E O

10

P E Z O L C F T D

11

In order to perform this test, please follow the instructions:

Snellen Test

1. Print the test page in A4 standard format. Place yourself 2.8 meters (or 9 feet) away from the chart. If the test page is in another format, or if you wish to perform the test facing the screen, you will have to calculate the distance at which you must stand facing it, using the following formula: measure the height of the letter E (first line, 20/200) in millimeters. Then, divide the value of this measurement by 88. Finally, multiply it by 6. The result shows the distance at which you must be placed, in meters.
E.g. $(42/88) \times 6 = 2.8 \text{ m}$
2. Test your visual acuity with correction (contact lenses or glasses).
3. Test one eye at a time. Start with the right eye, covering the left one without pressing on it. Then, examine the left eye by doing the opposite. If you are using correction glasses, you can cover the eye with a sheet of paper.
4. Read the letters from the largest to the smallest.
5. To make the examination easier and faster, another person can help you by showing the letters you must read among the lines of letters.
6. If you can read the letters of the 8th line, your sight is optimal (visual acuity 20/20).
7. If your visual acuity is less than 20/20 or if you have doubts about your sight, visit your ophthalmologist.

NOTE: take the results as a recommendation. The results do not indicate a diagnosis whatsoever. Performing the test does not mean you should skip regular visits to your eye doctor, because you could easily miss signs that only a trained eye care practitioner would find.

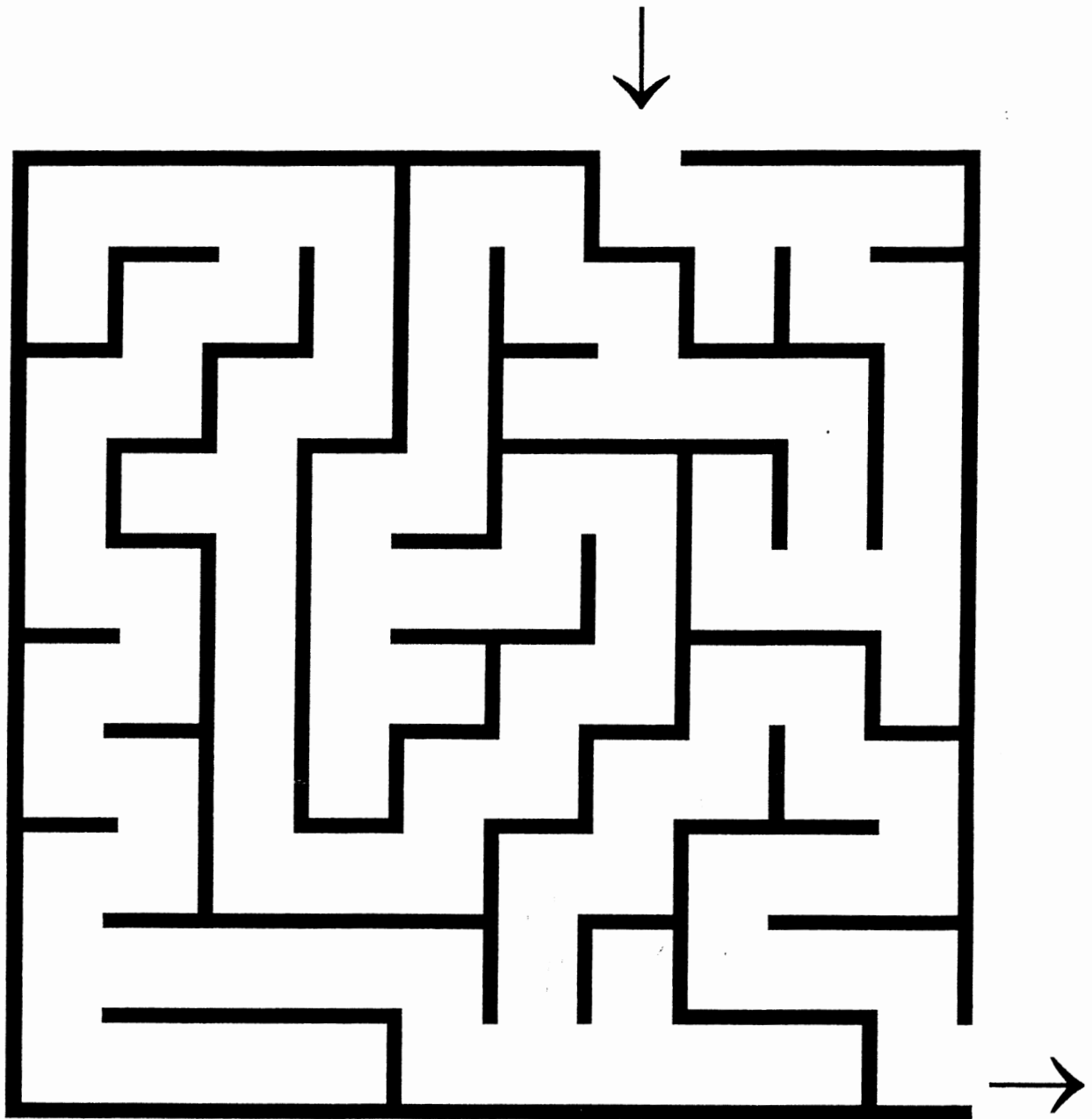
Maze Test Instructions

The Maze Test was developed as a pencil and paper test of attention, visuoconstructional ability, and executive functions of planning and foresight. The participants compete a simple demonstration maze first in order to establish the rule set, then complete the Maze Task. Performance is measured in time (in seconds), using a stop watch, and the total number of errors. Errors are determined by the number of times the participant enters a dead-end or fails to stay in the lines. Time to administer is 1–4 minutes. The Maze Test is in Appendix C; it should be printed on an 8 × 11" paper with the Maze Test at least 5.5" square and the practice 4.5".

The Maze Test is placed in front of the participant, and the examiner states, "I'm going to time you as you find the route from the start to the exit of the maze. Put your pen here at the start (point to the start). Here is the exit of the maze (point to the exit). Draw a line representing the route from the start to the exit of the maze. Don't run into any dead ends (point to a dead end) or cross any solid lines (point to a solid line). Go!" The instructions can be repeated, and the administrator should correct any rule breaks. There is a limit of 3 minutes for the Maze Test. If the maze has not been completed in this time, discontinue.

 Springer

MAZE TASK[©]



Date: _____
Patient name: _____
Task completed: _____ (yes / no)
Time to complete task: _____ (seconds)
Number of errors: _____

Spectrum of Driver Services: Right Services for the Right People at the Right Time

A description consumers and health care providers can use to distinguish the type of services needed for an older adult.



	COMMUNITY-BASED EDUCATION		MEDICALLY-BASED ASSESSMENT, EDUCATION AND REFERRAL		SPECIALIZED EVALUATION AND TRAINING
Program Type	Driver Safety Programs	Driving School	Driver Screen	Clinical IADL Evaluation	Driver Rehabilitation Programs (Includes Driver Evaluation)
Typical Providers and Credentials	Program specific credentials (e.g. AARP and AAA Driver Improvement Program).	Licensed Driving Instructor (LDI) certified by state licensing agency or Dept. of Education.	Health care professional (e.g., physician, social worker, neuropsychologist).	Occupational Therapy Practitioner (Generalist or Driver Rehabilitation Specialist*). Other health professional degree with expertise in Instrumental Activities of Daily Living (IADL).	Driver Rehabilitation Specialist*, Certified Driver Rehabilitation Specialist*, Occupational Therapist with Specialty Certification in Driving and Community Mobility*.
Required Provider's Knowledge	Program specific knowledge. Trained in course content and delivery.	Instructs novice or relocated drivers, excluding medical or aging conditions that might interfere with driving, for purposes of teaching / training / refreshing / updating driving skills.	Knowledge of relevant medical conditions, assessment, referral, and / or intervention processes. Understand the limits and value of assessment tools, including simulation, as a measurement of fitness to drive.	Knowledge of medical conditions and the implication for community mobility including driving. Assess the cognitive, visual, perceptual, behavioral and physical limitations that may impact driving performance. Knowledge of available services. Understands the limits and value of assessment tools, including simulation, as a measurement of fitness to drive.	Applies knowledge of medical conditions with implications to driving. Assesses the cognitive, visual, perceptual, behavioral and physical limitations that may impact driving performance. Integrates the clinical findings with assessment of on-road performance. Synthesizes client and caregiver needs, assist in decisions about equipment and vehicle modification options available. Coordinates multidisciplinary providers and resources, including driver education, health care team, vehicle choice and modifications, community services, funding / payers, driver licensing agencies, training and education, and caregiver support.
Typical Services Provided	1) Classroom or computer based refresher for licensed drivers: review of rules of the road, driving techniques, driving strategies, state laws, etc. 2) Enhanced self-awareness, choices, and capability to self-limit.	1) Enhance driving performance. 2) Acquire driver permit or license. 3) Counsel with family members for student driver skill development. 4) Recommend continued training and / or undergoing licensing test. 5) Remedial Programs (e.g., license reinstatement course for teens / adults, license point reduction courses).	1) Counsel on risks associated with specific conditions (e.g., medications, fractures, post-surgery). 2) Investigate driving risk associated with changes in vision, cognition, and sensory-motor function. 3) Determine actions for the at-risk driver: • Refer to IADL evaluation, driver rehabilitation program, and / or other services. • Discuss driving cessation; provide access to counseling and education for alternative transportation options. 4) Follow reporting / referral structure for licensing recommendations.	1) Evaluate and interpret risks associated with changes in vision, cognition, and sensory-motor functions due to acute or chronic conditions. 2) Facilitate remediation of deficits to advance client readiness for driver rehabilitation services. 3) Develop an individualized transportation plan considering client diagnosis and risks, family, caregiver, environmental and community options and limitations: • Discuss resources for vehicle adaptations (e.g., scooter lift). • Facilitate client training on community transportation options (e.g., mobility managers, dementia-friendly transportation). • Discuss driving cessation. For clients with poor self-awareness, collaborate with caregivers on cessation strategies. • Refer to driver rehabilitation program. 4) Document driver safety risk and recommended intervention plan to guide further action. 5) Follow professional ethics on referrals to the driver licensing authority.	Programs are distinguished by complexity of evaluations, types of equipment, vehicles, and expertise of provider. 1) Navigate driver license compliance and basic eligibility through intake of driving and medical history. 2) Evaluate and interpret risks associated with changes in vision, cognition, and sensory-motor functions in the driving context by the medically trained provider. 3) Perform a comprehensive driving evaluation (clinical and on-road). 4) Advise client and caregivers about evaluation results, and provides resources, counseling, education, and / or intervention plan. 5) Intervention may include training with compensatory strategies, skills, and vehicle adaptations or modifications for drivers and passengers. 6) Advocate for clients in access to funding resources and / or reimbursement. 7) Provide documentation about fitness to drive to the physician and / or driver-licensing agency in compliance with regulations. 8) Prescribe equipment in compliance with state regulations and collaborate with Mobility Equipment Dealer^ for fitting and training. 9) Present resources and options for continued community mobility if recommending driving cessation or transition from driving. Recommendations may include (but not restricted to): 1) drive unrestricted; 2) drive with restrictions; 3) cessation of driving pending rehabilitation or training; 4) planned re-evaluation for progressive disorders; 5) driving cessation; 6) referral to another program.
Outcome	Provides education and awareness.	Enhances skills for healthy drivers.	Indicates risk or need for follow-up for medically at-risk drivers.		Determines fitness to drive and provides rehabilitative services.

#DRS – Health professional degree with specialty training in driver evaluation and rehabilitation. *CDRS – Certified Driver Rehabilitation Specialist-Credentialed by ADED (Association for Driver Rehabilitation Specialists). +SCDCM – Specialty Certified in Driving and Community Mobility by AOTA (American Occupational Therapy Association).

^Quality Approved Provider by NMEDA (National Mobility Equipment Dealers Association).

Driver Rehabilitation Programs: Defining Program Models, Services, and Expertise.
Occupational Therapy In Health Care, 28(2):177–187, 2014

Spectrum of Driver Rehabilitation Program Services

A description consumers and health care providers can use to distinguish the services provided by driver rehabilitation programs which best fits a client's need.



Program Type	DRIVER REHABILITATION PROGRAMS Determine fitness to drive and / or provide rehabilitative services.		
Levels of Program and Typical Provider Credentials	BASIC Provider is a Driver Rehabilitation Specialist (DRS) [#] with professional background in occupational therapy, other allied health field, driver education or a professional team of CDRS or SCD ^{CM} with LDI ^{**} .	LOW TECH Driver Rehabilitation Specialist [#] , Certified Driver Rehabilitation Specialist*, Occupational Therapist with Specialty Certification in Driving and Community Mobility*, or in combination with LDI. Certification in Driver Rehabilitation is recommended as the provider for comprehensive driving evaluation and training.	HIGH TECH Driver Rehabilitation Specialist [#] , Certified Driver Rehabilitation Specialist*, Occupational Therapist with Specialty Certification in Driving and Community Mobility*. Certification in Driver Rehabilitation is recommended as the provider for comprehensive driving evaluation and training with advanced skills and expertise to complete complex client and vehicle evaluation and training.
Program Service	Offers driver evaluation, training and education. May include use of adaptive driving aids that do not affect operation of primary or secondary controls (e.g., seat cushions or additional mirrors). May include transportation planning (transition and options), cessation planning, and recommendations for clients as passengers.	Offers comprehensive driving evaluation, training and education, with or without adaptive driving aids that affect the operation of primary or secondary controls, vehicle ingress / egress, and mobility device storage / securement. May include use of adaptive driving aids such as seat cushions or additional mirrors. At the Low Tech level, adaptive equipment for primary control is typically mechanical. Secondary controls may include wireless or remote access. May include transportation planning (transition and options), cessation planning, and recommendations for clients who plan to ride as passengers only.	Offers a wide variety of adaptive equipment and vehicle options for comprehensive driving evaluation, training and education, including all services available in Low Tech and Basic programs. At this level, providers have the ability to alter positioning of primary and secondary controls based on client's need or ability level. High Tech adaptive equipment for primary and secondary controls includes devices that meet the following conditions: 1) capable of controlling vehicle functions or driving controls, and 2) consists of a programmable computerized system that interfaces / integrates with an electronic system in the vehicle.
Access to Driver's Position	Requires independent transfer into OEM [^] driver's seat in vehicle.	Addresses transfers, seating and position into OEM [^] driver's seat. May make recommendations for assistive devices to access driver's seat, improved positioning, wheelchair securement systems, and / or mechanical wheelchair loading devices.	Access to the vehicle typically requires ramp or lift and may require adaptation to OEM driver's seat. Access to driver position may be dependent on use of a transfer seat base, or clients may drive from their wheelchair. Provider evaluates and recommends vehicle structural modifications to accommodate products such as ramps, lifts, wheelchair and scooter hoists, transfer seat bases, wheelchairs suitable to utilize as a driver seat, and / or wheelchair securement systems.
Typical Vehicle Modification: Primary Controls: Gas, Brake, Steering	Uses OEM [^] controls.	Primary driving control examples: A) mechanical gas / brake hand control; B) left foot accelerator pedal; C) pedal extensions; D) park brake lever or electronic park brake; E) steering device (spinner knob, tri-pin, C-cuff).	Primary driving control examples (in addition to Low Tech options): A) powered gas / brake systems; B) power park brake integrated with a powered gas / brake system; C) variable effort steering systems; D) reduced diameter steering wheel, horizontal steering, steering wheel extension, joystick controls; E) reduced effort brake systems.
Typical Vehicle Modification: Secondary Controls	Uses OEM [^] controls.	Secondary driving control examples: A) remote horn button; B) turn signal modification (remote, crossover lever); C) remote wiper controls; D) gear selector modification; E) key / ignition adaptations.	Electronic systems to access secondary and accessory controls. Secondary driving control examples (in addition to Low Tech options): A) remote panels, touch pads or switch arrays that interface with OEM [^] electronics; B) wiring extension for OEM [^] electronics; C) powered transmission shifter.

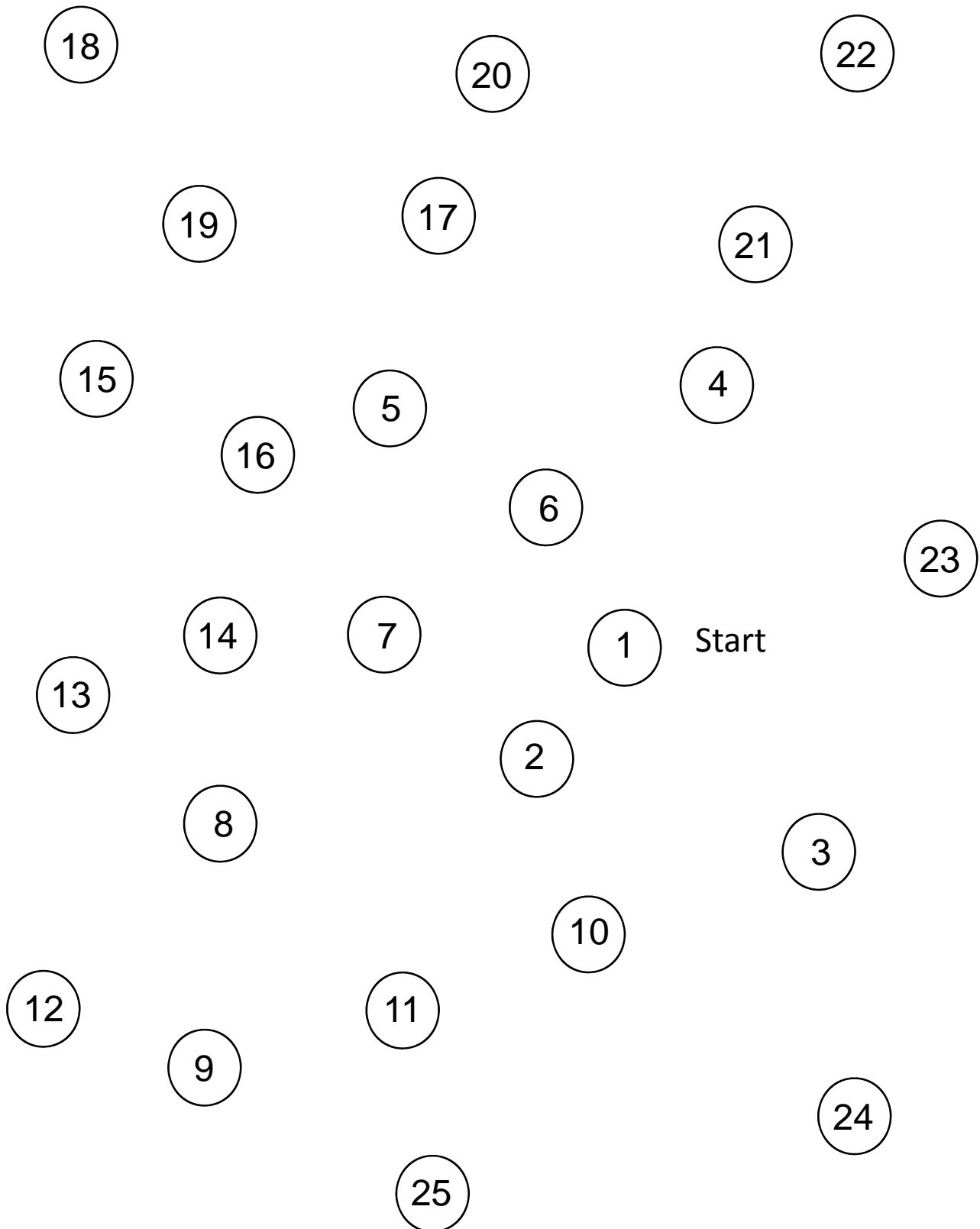
[#]DRS - Health professional degree with specialty training in driver evaluation and rehabilitation, ^{*}CDRS – Certified Driver Rehabilitation Specialist – Credentialed by ADED (Association for Driver Rehabilitation Specialists). ⁺SCDCM – Specialty Certified in Driving and Community Mobility by AOTA (American Occupational Therapy Association) [^]OEM – Original Equipment installed by Manufacturer.
^{**}LDI-licensed driving instructor.

Driver Rehabilitation Programs: Defining Program Models, Services, and Expertise.
Occupational Therapy In Health Care, 28(2):177–187, 2014

Trail Making Test, Part A

Client Name: _____

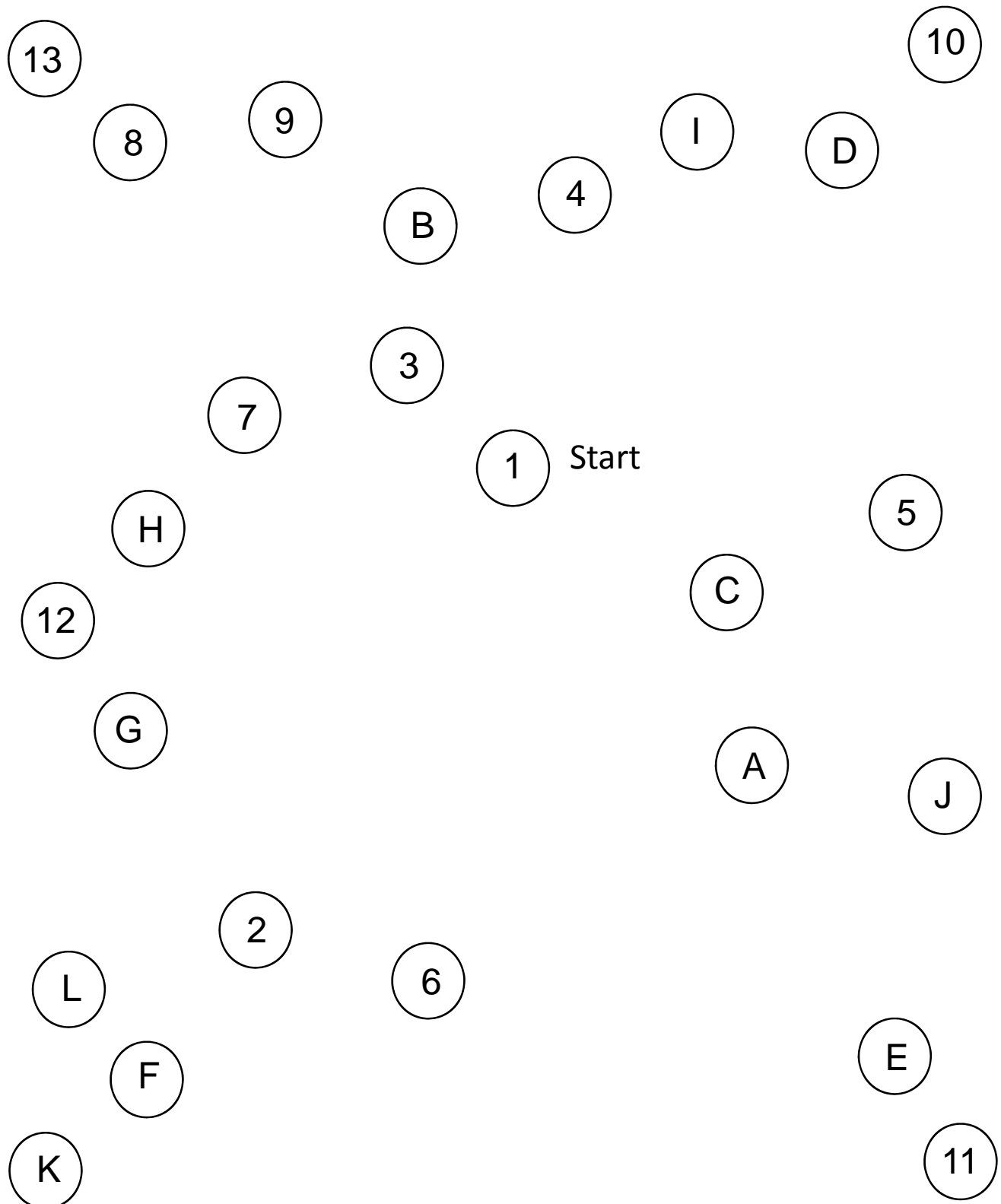
Date: _____



Trail Making Test, Part B

Client Name: _____

Date: _____



DOT HS 812 228
January 2016



U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**



Leading Change. Improving Care for Older Adults.



12052-012916-v6a