



The Older Driver

Gisele P. Wolf-Klein, M.D.

SUNY DOWNSTATE

April 8, 2013

Older Drivers Make the Headlines...

- March 24, 2010 (Chicago, Illinois): “86-Year-Old Driver Struck Three Teenage Cyclists”
- April 5, 2010 (Michigan: “82-Year-Old Woman Crashes into Hair Salon, Injures 2, But Keeps Hair Appointment”
- April 7, 2010 (Corpus Christi, Texas): “35 year old Woman hit by Elderly man hospitalized after crash on US 77. Witness noted the car was hit so hard his dentures were knocked out and fell onto the road.”
- March 28, 2010 (Largo, Florida): “84 year old with dizzy spells sent back to driver’s ed.”

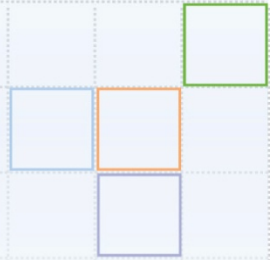


Chronological age and age-related cognitive deficits are associated with an increase in multiple types of driving errors in late life.

Anstey, Kaarin J.; Wood, Joanne. *Neuropsychology*, May 16, 2011

- Objective: Older driver research has mostly focused on identifying that small proportion of older drivers who are unsafe. We evaluated the association of cognitive function and age with driving errors.
- Method: A sample of 266 drivers aged 70 to 88 years were assessed on abilities that decline in normal aging (visual attention, processing speed, inhibition, reaction time, task switching) and the UFOV®, which is a validated screening instrument for older drivers. Participants completed an on-road driving test.
- Results: All error types increased with chronological age. Reaction time was not associated with driving errors in multivariate analyses. A cognitive factor measuring speeded selective attention and switching was uniquely associated with the most errors types. The UFOV® predicted blind-spot errors and errors on dual carriageways.
- Conclusion: We conclude that among older drivers, errors increase with age and are associated with speeded selective attention, particularly when that requires attending to the stimuli in the periphery of the visual field, task switching, errors inhibiting responses, and visual discrimination.

Older Drivers Demographics



- 1995: 33.5 million older drivers in the US
- 2005: 36 million older drivers
- 2020: 50 million older drivers

In 2020, one-fifth of all US drivers will be over the age of 65

Older Drivers Statistics

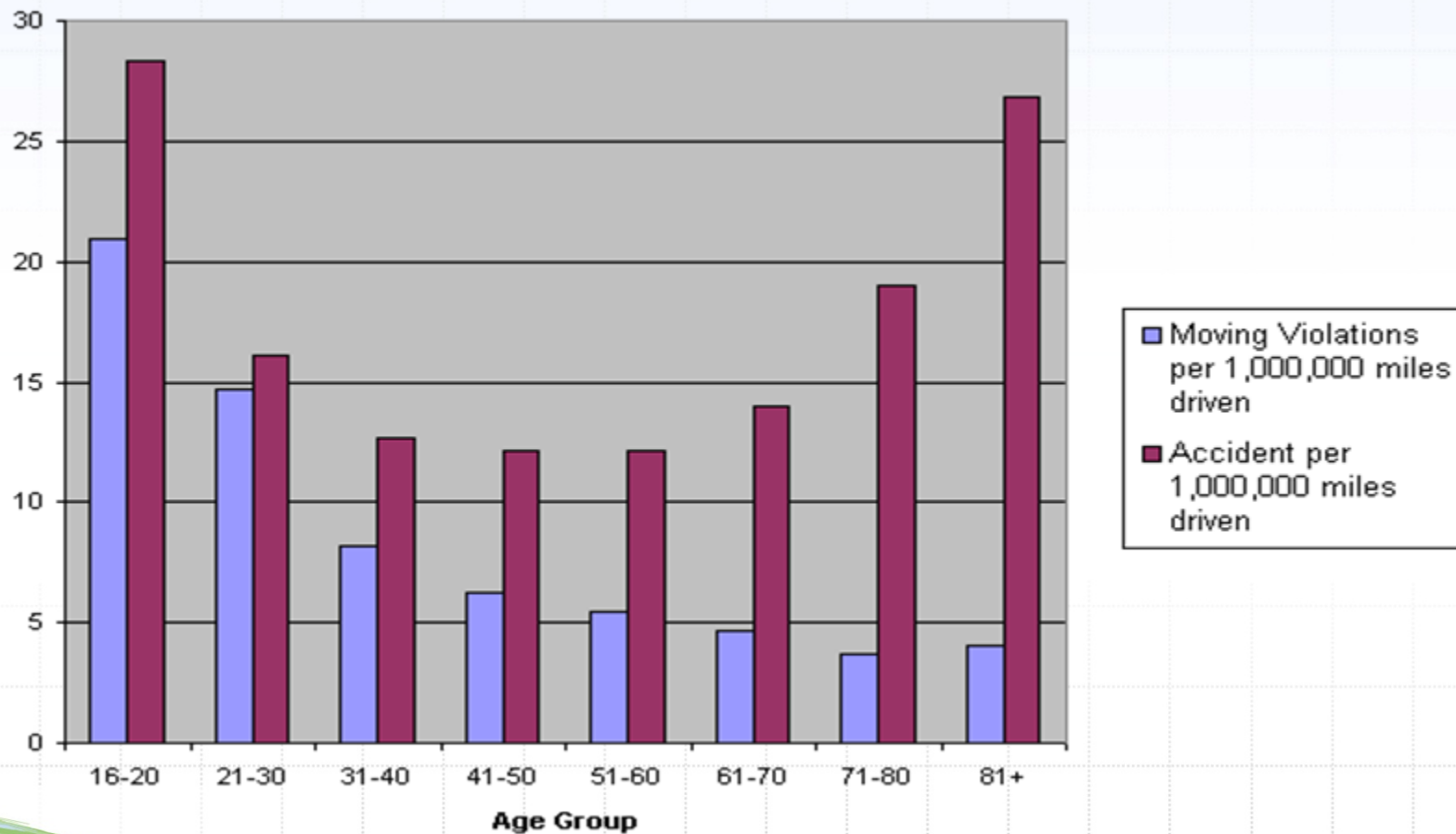
2007: 196,000 elderly individuals had traffic crashes

- 8% of all the people injured in traffic crashes during the year
- 14% of all traffic fatalities
- 14% of all vehicle occupant fatalities
- 19% of all pedestrian fatalities.

Most traffic fatalities involving older drivers: occurred during the daytime (79%), occurred on weekdays (72%), and involved other vehicles (71%).

National Highway Traffic Safety Administration (NHTSA) 2006-2007 Data

Moving Violations and Accidents By Age



How Do You Renew Your License?

- 23 states require licensed drivers of “a certain age” to appear periodically at a department of motor vehicles office to renew their license



Renewing Your Driving License: “Strict vs. Lenient”

- Strict: “Road Test”
 - Illinois, Florida, District of Columbia, New Hampshire, North Carolina
- Lenient: “No Tests”
 - New York, New Jersey, Vermont, etc
- VERY Lenient: “License Never Expires”
 - Tennessee
- Law: “Prohibit licensing administrators from age discrimination”
 - Nevada, Maryland, Massachusetts, Minnesota
- Exception: Veterans
 - Georgia

Maryland Testing of Cognitive Skills

- Maryland conducted a study on 1,910 drivers aged 55 to 96
- Drivers who performed poorly on cognitive tasks - such as following basic commands and repeating simple movements- were about 25% more likely to cause a car accident

Journal of the American Geriatrics Society, 2006

Age-based Licensing Restrictions in Washington, DC

- Individuals 70 or older must produce documentation from their physicians certifying their physical and mental competence.
- Individuals 75 and older must take written and road tests every four years.

Texas

“ My Mother is blind and they just renewed her license by mail”

Texas Senator John Corona, R-Dallas

“I’m doing fine!”

?
ANGER

?
DENIAL

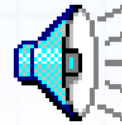
?
DEPRESSION

?
FRUSTRATION



Warning Signs of Unsafe Driving

- Inability to locate familiar places
- Failure to observe and obey traffic signs and speed limits
- Poor or slow decision-making in traffic
- Anger, confusion or frustration while driving





Warning Signs...

- Almost crashing: "close calls"
- Dents and scrapes on the car, on fences, mailboxes, garage doors, curbs
- Getting lost
- Difficulty seeing or following traffic signals, road signs, pavement markings, misjudging gaps
- Unable to change lanes, looking over shoulder
- Slow response, mixing up gas and brake pedals
- Easily distracted
- Received tickets or "warnings" in last 2 years

American Association of Retired Persons (AARP), April 2006

Driving Challenges for the Older Driver

- Reading street signs in town (27%)
- Driving across an intersection (21%)
- Finding the beginning of a left turn lane (20%)
- Making a left turn at an intersection (19%)
- Following pavement markings (17%)
- Responding to traffic signals (12%)

Benekohal et al. 1992, Publication No.FHWA-IL-023

The Dangerous Intersection!

- The single greatest concern for older drivers is the ability to safely maneuver through intersections.
- More than half of fatal accidents occur at intersections for drivers over age 80.



Driving Violation

The older driver is cited most frequently for failure to yield and improper use of lane.

Harkey, Huang & Zegeer, 1996



The Older Driver's Navigator



Concerns of Caregivers

- 70% have been concerned for a year that the older patient was not driving safely.
- Of the drivers identified, 85% were 75 and older.
- Safety problems most often reported are: slow reactions, slow driving, inattention to road hazards.

Caregivers Concerns

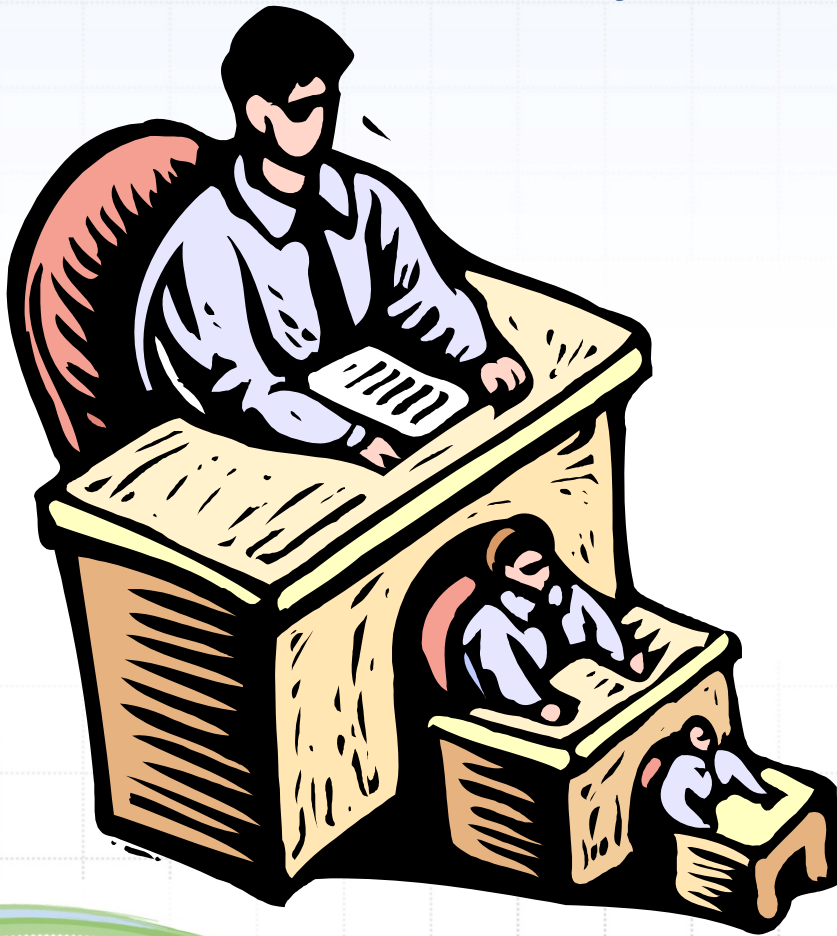
- Over 75% felt that driver had medical condition which impaired ability to drive safely. Vision, hearing and restricted movements problems were reported by half of the respondents.
- Over 60% felt there was a recent medical event which signaled the decline in driving.

Caregivers Concerns

- 60% of caregivers reported they were unable to discuss the problem with the driver
- 70% suggested help from their physician, such as a letter telling person not to drive and/or the physician reporting the person to DMV.

NYS Office for the Aging (518) 474-8388

Ethical Conflicts for Physicians: The Older Driver/Patient vs. The Family



- The patient wishes to continue to drive
- The family requests that the physician intervenes to persuade the patient to give up driving.

AMA Council on Ethical and Judicial Affairs (CEJA)

- “The impaired-driver problem illustrates the fundamental conflict between the responsibility physicians have to society and their responsibility to individual patients”
- Reporting is not mandatory
- “It is desirable and ethical for physicians to notify the appropriate state agency if an impaired patient fails to appropriately restrict his/her driving”

AMA Council on Ethical and Judicial Affairs (CEJA)

- Physician must evaluate patient's physical and/or mental impairment that might affect driving.
- Physician should consult with the patient and/or family to recommend therapy and suggest changes in driving patterns

AMA, Interim Meeting, December 1999

Knowledge, Attitudes and Practices of Geriatricians Regarding Patients with Dementia Who are Potentially Dangerous Automobile Drivers: A National Survey

- Probability Sample of 467 US geriatricians
- Results: More than 28% of all geriatricians do not know how to report patients with dementia who are potentially dangerous drivers. A 22% difference exists between California and other US states. Over 75% agree that physicians are responsible for reporting patients. More than 86% would contact state

Cadle et al, J Am Geriatr Soc 48:14-17, 2000



Initial Screening

- ***Observe the patient***

- Impaired personal care such as poor hygiene and grooming
- Impaired ambulation such as difficulty walking or getting into and out of chairs
- Difficulty with visual tasks; and impaired attention, memory, language expression or comprehension

- ***Be alert to red flags***

- Medical conditions
- Medications and polypharmacy
- Review of systems
- Patient or family member's concern

Figure 1.1 Physician's Plan for Older Drivers' Safety (PPODS)

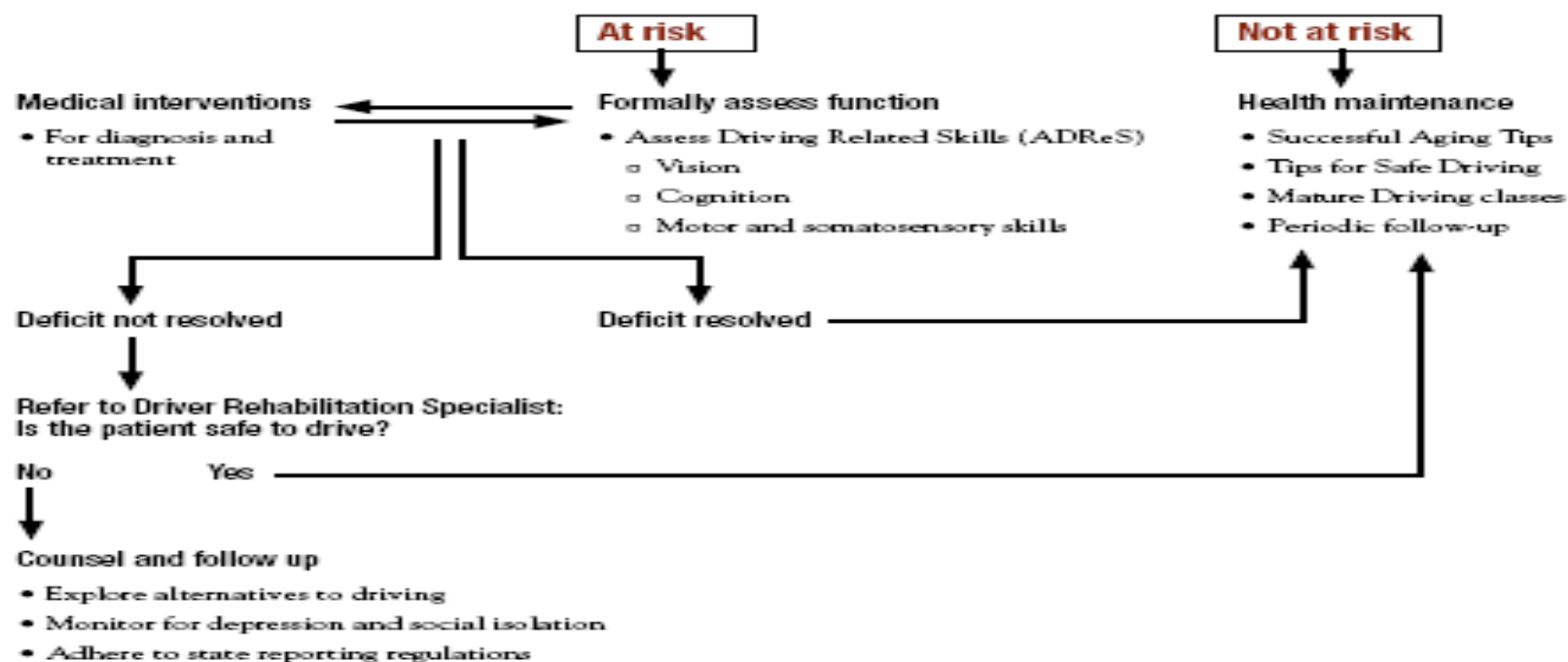
Is the patient at increased risk for unsafe driving?


Perform initial screen—

- Observe the patient
- Be alert to red flags
 - Medical conditions
 - Medications and polypharmacy
 - Review of systems
 - Patient's or family member's concern/ impaired driving behaviors

If screen is positive—

- Ask health risk assessment/social history questions
- Discuss alternatives to driving early in the process
- Gather additional information





Fact #5: Physicians Can Influence Their Patients' Decisions to Modify or Stop Driving. They Can Also Help Their Patients Maintain Safe Driving Skills.

American Medical Association: (2/2010), 246 page physician guide “Assessing
and Counseling Older Drivers”





<http://www.ama-assn.org/ama1/pub/upload/mm/433/older-drivers-guide.pdf>

Exploratory Study of Incident Vehicle Crashes Among Older Drivers

- Prospective 5 year cohort of all 118,553 licensed drivers (age 55+) in Alabama.
- 174 subjects: 24 died, 6 stopped driving and 61 sustained 76 crashes.
- Risk factors: prior crash (p.008), frequent falling or tripping (p.08), difficulty opening a jar (p.004), hx of CVA or TIA (p.03), hypnotic (p.01)

Sims et al J. of Gerontology 2000, Vol 55A

Table 1. Demographic and Historical Variables
in Relation to Vehicle Crashes

Variable	Percentage with Characteristic	Crash Rate*	RR 	95% CI	p
Age (yr)					
55-63	22.3	9.6	REF		
64-69	24.6	9.5	1.12	0.58, 2.19	.74
70-77	26.3	8.2	0.97	0.45, 2.08	.94
78 +	26.9	11.0	1.12	0.50, 2.52	.79
Gender					
Female	47.4	8.2	REF		
Male	52.6	6.7	0.82	0.48, 1.399	.45
Race					
White	85.1	12.3	REF		
Black	14.9	16.9	1.37	0.70, 2.66	.84
Prior vehicle crash 	34.9	12.6	2.12	1.21, 3.69	.008
Frequent falling or tripping 	15.4	19.5	1.85	0.93, 3.68	.08
≥ 8 Alcoholic drinks/week 	11.4	7.7	0.88	0.40, 1.98	.76

Notes: RR = relative risk, CI = confidence interval, REF = reference value
for the odds ratio, which equals 1.0.

* Per million miles driven.


 Adjusted for age, race, gender, and days driven per week.

Table 2. Medications in Relation to Vehicle Crashes

Medication Class	Percentage with Characteristic	Crash Rate*	RR †	95% CI	p
Diuretic	19.1	12.5	1.08	0.53, 2.22	.83
Calcium channel blocker	15.0	11.6	1.23	0.65, 2.33	.52
Nonsteroidal anti-inflammatory drug	12.1	13.9	1.56	0.78, 3.14	.21
Beta blocker	11.0	6.2	0.66	0.28, 1.55	.34
Nonprescription	9.2	9.9	1.20	0.56, 2.55	.64
Estrogen	9.1	8.2	0.65	0.21, 2.03	.46
Hypnotic	8.7	28.1	2.92	1.29, 6.57	.01
Antidepressant	8.1	13.6	1.43	0.63, 3.24	.40
Benzodiazepine	6.9	19.4	2.04	0.85, 4.85	.11
Sedating antihistamine	5.8	16.9	1.88	0.64, 5.48	.25
Adrenocortical extract inhibitor	5.2	4.7	0.58	0.08, 4.32	.59
Oral hypoglycemic	4.6	7.0	0.87	0.21, 3.58	.84
Skeletal muscle relaxant	3.5	29.2	2.72	0.87, 8.47	.09
Centrally acting antihypertensive	2.9	8.2	0.73	0.17, 3.07	.67
Alpha blocker	2.3	19.1	1.30	0.18, 9.72	.80
Anticonvulsant	2.3	7.8	0.77	0.11, 5.61	.80
Insulin	2.3	11.9	1.73	0.42, 7.21	.45
Barbiturate	1.7	14.6	1.42	0.19, 10.34	.73
Narcotic	1.2	30.2	2.05	0.24, 17.56	.51
(+) Urinary benzodiazepines	7.1	11.1	1.27	0.50, 3.22	.62
(+) Urinary opiates ‡	3.6	27.9	2.29	0.53, 9.87	.27
No medications	42.8	8.2	REF		
1 - 2 Medications	42.9	10.1	1.24	0.71, 2.18	.45
≥ 3 Medications	14.3	12.1	1.58	0.70, 3.59	.27

Notes: RR = relative risk, CI = confidence interval, REF = reference value for odds ratio, which equals 1.0.

* Per million miles driven

† Adjusted for age, gender, race, and days driving per week.

‡ No other agents detected in urine.

Table 3. Self-Reported Functional Impairments
Related to Vehicle Crashes

Activity Limitation*	Percentage with Characteristic	Crash Rate†	RR‡	95% CI	p
Negotiating stairs	20.6	11.9	1.36	0.67, 2.76	.39
Walking a block	18.9	14.9	1.68	0.85, 3.34	.14
Getting out of bed or chair	18.9	11.8	1.36	0.68, 2.71	.38
Yardwork/light housework	15.4	17.6	2.10	1.11, 3.98	.02
Opening a jar	12.6	23.5	3.09	1.42, 6.73	.004
Uses a hearing aid	12.6	6.1	0.66	0.22, 1.97	.46
Reaching out	10.9	25.5	2.32	0.95, 5.67	.07
Driving	8.6	11.3	2.35	0.89, 6.19	.08
Uses a walk aid (e.g., cane)	8.6	10.0	1.31	0.39, 4.39	.66
Taking a bath or shower	6.9	25.0	2.50	0.84, 7.47	.10
Getting dressed/undressed	5.7	24.2	2.32	0.65, 8.25	.20
Walking around house	4.0	15.9	1.54	0.35, 6.67	.57
No difficulty w/ activities	69.2	7.8	REF		
Difficulty w/ ≥ 1, <4 activities	23.4	12.2	1.57	0.81, 3.01	.18
Difficulty w/ ≥ 4 activities	7.4	21.8	3.01	0.97, 9.41	.06
P for trend					.06

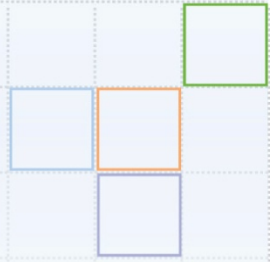
Notes: RR = relative risk, CI = confidence interval, REF = reference value for the odds ratio, which equals 1.0.

* No subject reported difficulty using a telephone, handling money, feeding, shopping, or preparing meals.

† Per million miles driven

‡ Adjusted for age, gender, and days driven per week.

Vision Screening



Vision is the primary source of information in driving

BUT...

Simple test of visual function are not sensitive

The Useful-Field-Of-View (UFOV) test , a combined measure of visual processing speed, attention and sensory function is more predictive of vehicle crashes

Owsley C et al Ophtal Epidemiol. 1998; JAMA 1998



Macular
Degeneration –
What they See



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

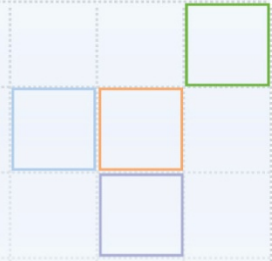
F D P L T C E O

10

P E E L C F T D

11

Motor



- Rapid Pace Walk
 - Walking 20 feet
 - > 9 seconds is a problem
 - ≥ 7 seconds – 2 times to have traffic event
- Manual Test of Strength
 - <4/5 upper and lower extremities requires intervention
- Range of Motion
 - Limited range of motion (neck, head, joints)
 - Range of motion with excessive hesitation or pain

Staplin L, Gish KW, & Wagner EK. (2003). MaryPODS revisited: updated crash analysis and implications for screening program implementation. *J Safety Res.* 34:389–397.

Marottoli RA, Cooney LM, Wagner R, Doucette J, & Tinetti ME (1994). Predictors of automobile crashes and moving violations among elderly drivers. *Ann Intern Med.* 121(11):842–846.

What Can We Do?

- Treat underlying medical problems
- Referral to Ophthalmologist
- Referral to Physical Therapy/Occupational Therapy
- Driver Rehabilitation Specialist
 - Occupational therapy background
 - Evaluates the client's driving skills
 - Can suggest vehicle and/or route modifications (e.g., such as avoiding left hand turns) to enable the person to resume or continue driving safely
 - Vehicle inspection/modification
 - Expensive: \$300-400 for full assessment, \$100/hr rehab

Older Driver Rehabilitation

- Evaluation by licensed OT driver specialist
- 4 to 16 hours of treatment
- Consider vehicle adaptations
- Partnering with navigator (spouse/friend)
- AARP's "55 Alive"

The Older Demented Driver



- Drivers with Alzheimer's Disease may be able to continue driving for several years after diagnosis is made

(Whitehouse, Post)

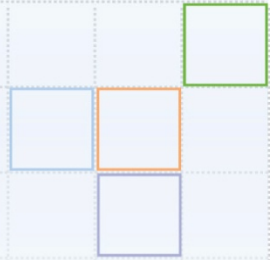
Characteristics of Motor Vehicle Crashes of Drivers with Dementia of the Alzheimer Type

- Design: A 5-year retrospective analysis of state-recorded crash data followed by patient enrollment into a study on road tests.
- Results: Alzheimer Patients with mild cognitive changes have similar crash rates to those of controls.

Carr, J Am Geriatr Soc 48:18-22, 2000

The Older Demented Driver

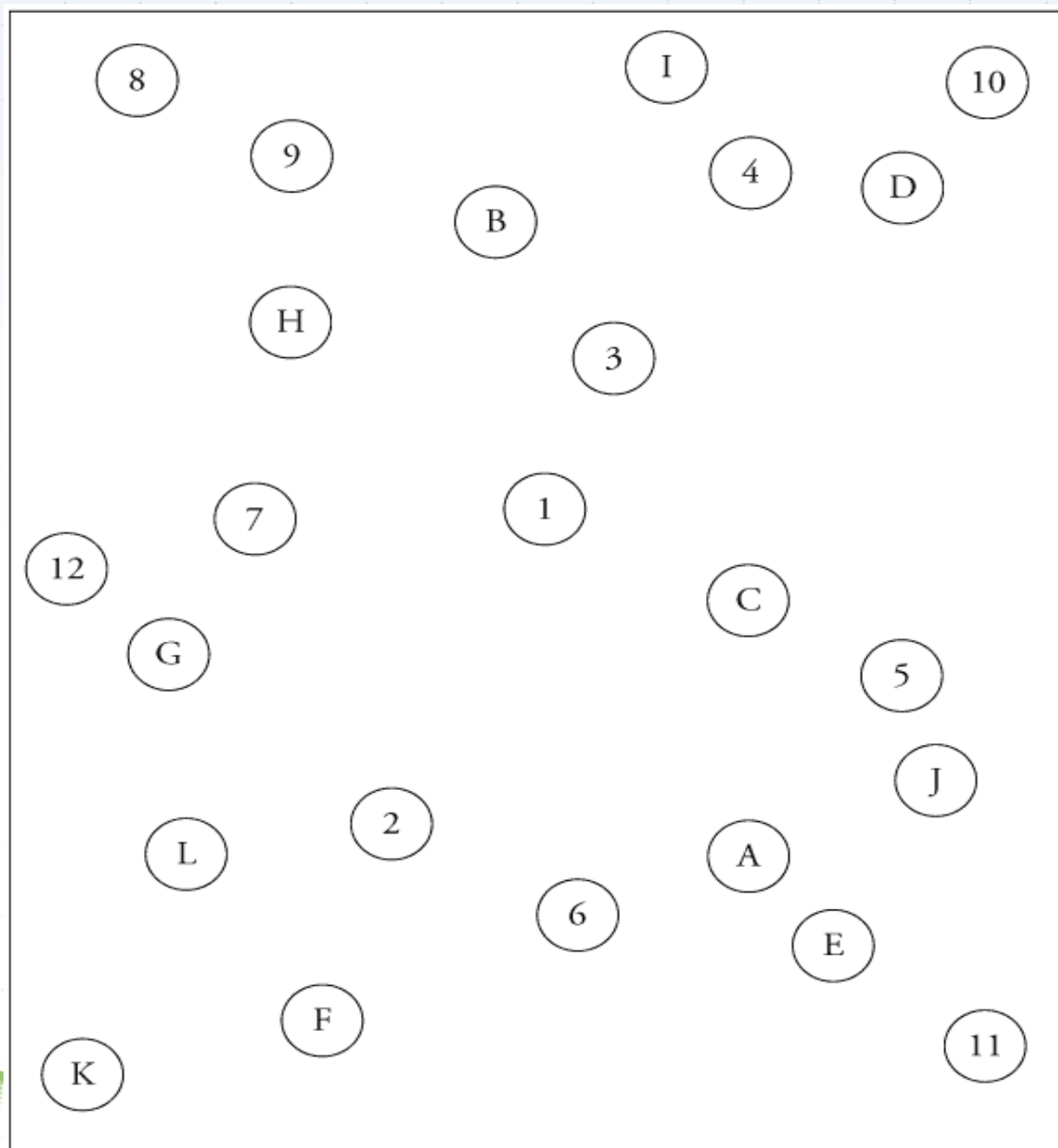
- Psychological tests can help determine whether AD patients have the memory, perception and coordination needed to drive safely.
- There are no definitive, quantifiable, standardized test to pinpoint when driving should be stopped.



Trail Making Test

- 1) Stutts, J. C., Stewart, J. R., & Martell C. (1998). **Cognitive test performance and crash risk in an older driver population.** *Accid Anal Prev.* 30(3):337–346.
 - North Carolina, 3200 Drivers at renewal , > 65 years old
 - 3 year look back for traffic accidents
 - Scored lowest 10% had 1.5 times more crashes

- 2) Ball, K. K., Roenker, D. L., Wadley, V. G., et al. (2006). **Can high-risk older drivers be identified through performance-based measures in a Department of Motor Vehicles setting?** *J Am Geriatr Soc.* 54:77–84.
 - Maryland, 1900 subjects, >55 years old
 - Took 147 seconds or longer to complete Trails B were 2.01 times as likely to crash.





Clock Drawing Test

Freund B, Colgrove LA, Petrakos D, McLeod R.
In my car the brake is on the right: pedal errors among older drivers. Accid Anal Prev. 2008 Jan;40(1):403-9.

- Virginia, 180 participants 65 and older.
- MMSE, Trail Making test, Clocking drawing with 30 driving simulator
- Clock drawing test best predictor for pedal errors (odds ratio=10.04, $p<.0001$), followed by age ≥ 84 (odds ratio 6.10, $p<.05$)

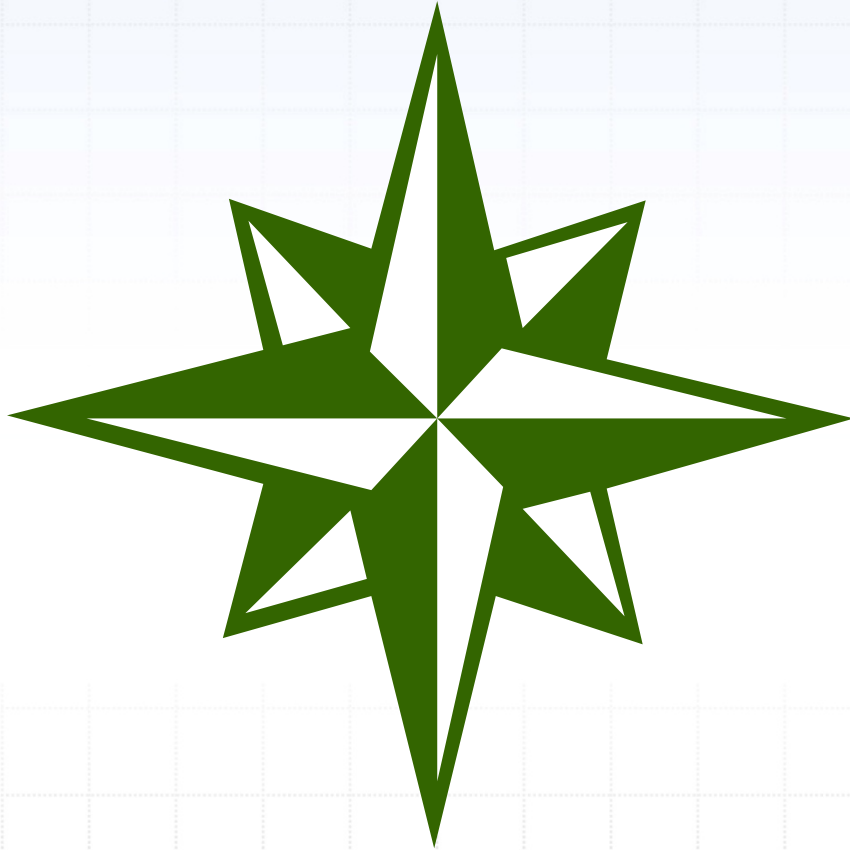


Mini Mental

Paccalin M, Bouche G, Barc-Pain S, Merlet-Chicoine I, Nedelec C, Gil R. **Automobile driving among patients with dementia. Survey in the Poitou-Charentes region.** Presse Med. 2005 Jul 23;34(13):919-22.

- 146 patients (74 Female)
- Mini Mental Status Exam of <25, Avg MMSE 17+/-5.6
- 52 were still driving at the time
- 48 stopped driving, 9 because of motor vehicle
- Drivers were mainly male ($p=0.0002$), younger ($p=0.001$) and more recently diagnosed ($p=0.003$).
- Half those still driving drove only occasionally (<3 times a week), usually during daylight and for short distances.

Practical Tips for the Older Driver



- Restricted driving:
- Day driving only
- Specified areas
- Specified hours
- Use of navigation system
- Use of cellular phones

Giving Up Driving

- More than 600,000 drivers age 70 and older decide to give up driving each year

American Journal of Public Health, 2002

Transportation Alternatives for Long Island

- Carpool Lane on Northern State Parkway : 74% opposed
- Carpool Lane on the LIE : 57% opposed
- Rush hour toll on LIE: 58% opposed
- Tunnel beneath Long Island Sound: 74% opposed
- Intra-island light rail: 83% in favor

Newsday poll, 3-6-2000

Counseling the Patient Who Can No Longer Drive

- Transportation alternatives
 - walking, bus, trains, taxi, community transport services, delivery services, volunteer drivers (church, synagogue), paratransit.
- Family and caregiver assistance
 - Support the caregiver
 - National Family Caregivers Association (NCFA) (800)896-3650 or www.nfcacares.com.
- Reinforce driving cessation
 - Prescription: “Do Not Drive”
 - Official Notice

Resources

- “Concerned About an Older Driver? A Guide for families and Friends” - AAA (202 775-1456)
- “The Older Person’s Guide to Safe Driving”
Public Affairs Pamphlet No 641, 381 Park Ave.
South, New York, N.Y.10018

Giving Up Driving Brochures

Oregon's Safe Mobility Initiative

How to Refer an Unsafe Driver

To report the driver to DMV, you can visit a local DMV office to complete a form or write a letter to DMV describing the person's health problem or unsafe driving behavior. You must include both your name and address and the person's name and address in the letter. You can request that your name be kept confidential.

DMV may require medical information from the person's doctor or may contact the driver for re-testing. Depending on the test results, DMV will determine whether or not the person may continue to drive with or without restrictions, or whether the person should stop driving.

Alternatives to Driving

Many social needs are met through driving. People who live alone and no longer drive may feel isolated. Arrange for frequent visits to the home, and plan outings with friends and family that will help the person remain socially active. Family members, neighbors and caregivers can provide transportation to appointments and errands. Explore options to have groceries or prescriptions delivered. The local senior center may offer a shuttle service. For resources in your community, call the Area Agencies on Aging (AAA) at 1 (800) 282-8096.



For more information

Driver and Motor Vehicle Services Driver Safety Unit

1905 Lana Ave. NE
Salem, OR 97314
(503) 945-5083
TTY (503) 945-5001
www.oregondmv.com

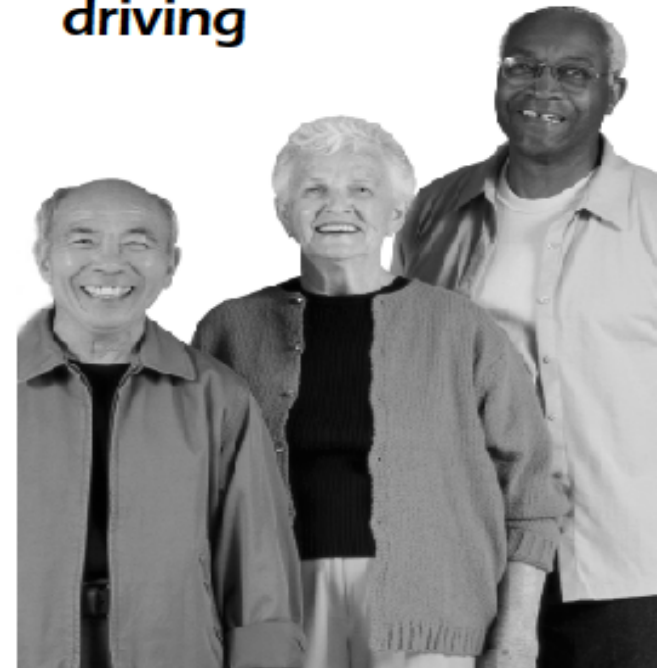
Printed by
Oregon Department of
Transportation Driver and
Motor Vehicle Services

Form 735-7240 (3-03)
STK #300046



Retiring from Driving

When someone you know should give up driving



Shifting Gears in Later Years

Oregon Driver and Motor Vehicle Services