Driving and Dementia

Jason Wilbur, MD
Associate Professor (Clinical)
Department of Family Medicine
University of Iowa
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I’ll have a cheeseburger, large fries, black coffee...

I’m starting to think retesting seniors for driving isn’t a bad idea!
Objectives

- Describe factors associated with driving ability and how these factors can change with age and cognition.
- Describe the role of the health care team in evaluating the older driver with cognitive problems.
- Develop a primary care approach to assessing and counseling the older driver.
- Determine next steps after an older patient is deemed to be an at-risk driver.
Police: 100-year-old driver hits 11 people in Los Angeles

From Rosalina Nieves and Stella Chan, CNN

updated 6:17 AM EDT, Thu August 30, 2012
True story…

Healthy 77 year old male driver is involved in a MVC, rear-ending another car at 35 mph on a rainy evening. Not restrained. Head hit steering wheel. No LOC. Police officer offers to call ambulance, but patient drives home. Found comatose at home 2 hours later. Dies 1 week later of intracranial hemorrhage.
Another true story…

Moderately demented 80 year old female stops driving at the insistence of her family and doctor. She becomes isolated in her farmhouse. She develops depression and loses weight. It takes 6 months for anyone to recognize that there is a problem.
And here’s what we get…

- From family: “Is grandpa (or dad or husband) safe to drive?”
- From patient: “Are you trying to take away my license?”
Anecdotes are great, but what about some data?
Who’s driving?

- Based on telephone survey data (so, by definition independent enough to have a phone):
  - 75% of community-dwelling adults 75-84 years old reported driving
  - 70% of adults 85 and over reported driving
  - 82% of these drivers limit their driving (e.g., avoiding night driving, bad weather)

The older driver “problem”

- In 2010, persons >/= 65 y.o. made up 15% of the population but 18% of crash fatalities.
- Compared to young adult drivers, older drivers are more likely to:
  - Be involved in an accident
  - Die in an accident
  - Be held responsible for the deaths of others
But...put that in context...how much are older people on the road?
Figure 1: Average Annual Miles Driven by Driver Age Group
Adapted From 1995 NPTS Data
Absolute number of accidents per 100 licensed drivers changes little with age.

Crash fatalities per 1000 accidents increase with age.

Fatal crash rate per 10,000 licensed drivers increases with age.

Fatal crash rate per 100 million VMT increases with age (most dramatic change).
Figure 2: Driver Accident Involvements and Fatalities by Age Group
Adapted From 1995 NPTS
Insurance Institute for Highway Safety, 2009
Deaths per 1,000 drivers by age

Insurance Institute for Highway Safety, 2009
The older driver “problem”

- In two vehicle crashes, drivers $\geq 80$ y.o. are more likely to be responsible for fatalities than any other age group—even when compared to 16 year olds!
Risk to self

Risk to others

The older driver “problem”

- Older drivers are more likely to kill *themselves* in accidents:
  - 70% or more of the deaths are the drivers themselves in older age groups
  - Compare this to 50% or less for teens
The older driver “problem”

- As is well known, older persons represent an increasing percentage of our society.

- Due to cultural shifts, a greater proportion of older persons will drive, and they are likely to drive more miles per year and continue to drive to more advanced ages.

- So . . .
More older drivers will be involved in car crashes and more will die.

“Drivers aged 65 and older . . . are expected to account for as much as 25% of total driver fatalities in 2030, compared to 14% currently.”

Insurance Institute for Highway Safety, 2000
Don’t lose perspective!

Young males have the highest rates of responsibility for deaths per licensed driver.

Drivers $\geq 65$ y.o. are involved in a smaller absolute number of deaths than other age groups.

Older drivers who may be impaired tend to quit driving on their own or on the advice of others.
Demented drivers

- No studies show that demented drivers have more crashes
- However, studies consistently show worse driving performance in demented patients
- Demented patients are more likely to fail on-the-road testing
"Marie, are you still driving?"
What’s a health care provider to do with this information?
Primary care physicians have ethical obligations.

- Beneficence: protect the patient’s health.
- Justice: ensure the safety of other drivers on the road.
- Confidentiality: protect the patient’s privacy.
Barriers to assessing driving in primary care

- Fear of liability, due to under- and over-diagnosing driving impairment.
- Uncertainty of the health care provider’s role in assessing driving.
- Concerns about the patient’s response.
- Poor predictive ability of office-based testing.
- Competing demands.
AMA Ethical Opinion

- Physicians should assess patient’s physical and mental impairment
- Tactful discussion before reporting
- Must use best judgment
- Report medical condition that impairs driving safety
- Report minimal amount necessary
- Work with state medical societies to create statutes that uphold patient and community interests and safeguard good faith reporting
Sketchy reporting laws

- Under Iowa law, reporting is voluntary.

- A health care provider may report to the DOT “the identity of a person who has been diagnosed as having a physical or mental condition which would render the person physically or mentally incompetent to operate a motor vehicle in a safe manner.”
Sketchy reporting laws

- Immunity and legal protection are available to reporters in Iowa.

- A physician reporting a driver “shall be immune from any liability, civil or criminal, which might otherwise be incurred or imposed as a result of the report.”
Systems necessary for driving

- Visual (95% of sensory input for driving)
- Hearing (less important)
- Neurological
- Musculoskeletal
Cognitive skills needed for driving

- Perception
- Attention (focused/divided)
- Working memory
- Executive function
Stimulus or hazard

Perceive, attend, interpret stimulus

Executive function

Plan action

Previous experience

Execute action

Outcome

Perception, attention

Memory
Physiologic changes with aging

- Muscle strength
- Processing speed
- Divided attention
- Accommodation
- Low-contrast acuity
- Auditory sensitivity

- Reaction time
- Sensitivity to glare
Driving is an instrumental activity of daily living (IADL).

Like other IADLs, driving can be affected by age-related physiologic changes.

Older persons may change behaviors—voluntarily or under advice, consciously or unconsciously—in order to adapt and continue driving.
Function, function, function

Driving is an “over-learned” skill, AND

the sum may be greater than the individual parts would lead you to believe.
How good are we?

- There is plenty of evidence that healthcare providers miss cognitive impairment and mild dementia.
- One study of drivers with cognitive impairment found that only 5% of patients were identified as cognitively impaired by their physicians (JAGS 2002;50:1285).
What are the responsibilities of the health care provider?

- Identify older drivers at risk
- Determine if an older driver is likely to be a medically impaired driver
- Determine if there are options for rehabilitating the medically impaired driver
- Counsel the patient (and caregiver) when driving cessation is appropriate
Identify older drivers at risk

- Should every person over a certain age be assessed for medically impaired driving?
- Probably not (AMA recommends against this approach).
Identify older drivers at risk

- Look for “red flags”
  - Significant cardiovascular or neurologic events or diseases.
  - Eye disease resulting in significant visual impairments.
  - Musculoskeletal disease resulting in significant mobility or strength impairments.
  - Patient or family member concerns.
  - Medications—drug effects and polypharmacy.
Identify older drivers at risk

- Common medical problems that put patients at risk for medically impaired driving:
  - Dementia
  - Stroke
  - Cardiac arrhythmia
  - Seizure
  - Osteoarthritis
Identify older drivers at risk

- Medications are often associated with driving impairment:
  - Anticholinergics
  - Anticonvulsants
  - Antidepressants
  - Antiemetics
  - Antihistamines
  - Antihypertensives
And more meds . . .
- Antiparkinsonians
- Antipsychotics
- Benzodiazepenes
- Muscle relaxants
- Narcotics
- Stimulants
- Other sedative/hypnotic/anxiolytics
Assessing older drivers…

- Little evidence to guide…so, we rely on expert consensus (BOGSAT)
Formal assessment for medically impaired driving

- Start with a focused history.
  - Questions about driving.
  - Substance abuse.
  - Pertinent medical problems.
  - Function: other activities of daily living.
  - Medications.
What should you ask?

- **Background information:**
  - frequency, length and reasons for trips
  - types of road used
  - adverse condition driving
  - presence of passengers.

- **History of driving errors**
  - Tickets
  - Accidents
  - near misses
  - getting lost
Surprise, surprise!!!!!!

- Patients with dementia are poor driving historians and poor judges of their own driving ability.
  - Self-ratings of driving safety do not correlate with on-the-road driving test performance in demented persons.
  - In mildly demented patients, 94% self-rated as safe drivers but only 41% passed a driving test (JAGS 2005;53:94)
Caregiver’s rating of driving

- Caregiver concerns about driving correlate with risk for future crashes.
- Ask caregiver the same questions you ask the patient.
- Ask a family member or caregiver: “Do you feel safe with Ms. X driving?”
  - Even better: “Do you let Ms. X drive little Johnny (your son or daughter?”
ALL patients with dementia should be considered at-risk drivers.
Formal assessment for medically impaired driving

- Visual fields
- Visual acuity
- Mobility
- Strength
- Cognitive skills

Briefly address the non-cognitive areas
Drivers with binocular visual field loss had driving accident and conviction rates >2 times as high as age- and gender-matched controls with normal fields.

AMA recommendation: visual field testing by confrontation.
Visual acuity

- Optimal visual acuity for driving is not known.
- Most states require 20/40 or better corrected vision to obtain a license without restrictions (Iowa, Illinois, Missouri).
- AMA recommendation: screen visual acuity with a Snellen chart.
Mobility

- The minimum range of motion required to operate a vehicle is dependent upon the construction of the vehicle.

- Optimal mobility is not known.

- AMA recommendation: 20 foot timed rapid pace walk and assessing manual range of motion.
Strength

- Less than 4/5 strength in either upper extremity or in the right lower extremity should prompt intervention.

- Strength requirements depend on the type of car driven.

- AMA recommendation: evaluate strength in all extremities.
Now, on to the brain!
In primary care geriatrics…

- We have two issues:
  - Is this patient cognitively impaired?
  - Is this patient’s cognitive impairment or mild dementia putting her at risk for car crashes?
Here’s an issue we don’t have...

- What to do with the driver who has moderate to severe dementia?

- There is near universal agreement that these patients should not be driving.

- Recommend against driving.
What office cognitive assessments correlate with driving skills?
Everyone’s personal favorite?

- MMSE
  - Score of $\leq 24$ is associated with unsafe driving (risk of failing on-the-road test)
  - No good studies associating MMSE score with crash risk
  - Not recommended by AMA
Office tests of visual-spatial and planning skills may be more useful.
Cognitive assessments

- Trail-Making Test, Part B (TMT-B)
  - In retrospective and prospective studies, abnormal TMT-B test scores have been associated with crash risk.

- AMA recommendation: use the TMT-B with a cut-off of < 180 seconds for normal.
Trail-Making Test, Part B

Patient's Name: ________________________________  Date: ____________________

12  7  1  10
8  9  I  B
4  11
H  G  L
F  K
E  A
C  J  5
D

Physician's Guide to Assessing and Counseling Older Drivers
American Medical Association/National Highway Traffic Safety Administration/US Department of Transportation • June 2005

Chapter 3—Formally Assess Function
Cognitive assessments

- Clock Drawing Test (CDT)
  - Errors made in the Freund scoring system correlate significantly with specific driving errors.

- AMA recommendation: use the CDT and score with the Freund system.
What about the patient already diagnosed with dementia?
AAN Clinical Guidelines

- Published in 2010
- Recommend using the Clinical Dementia Scale (next slide) to assess risk
<table>
<thead>
<tr>
<th>Categories</th>
<th>Impairment</th>
<th>0</th>
<th>0.5</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Memory (major category)</strong></td>
<td>No memory loss or slight inconsistent forgetfulness</td>
<td>Consistent slight forgetfulness, partial recollection of events, “benign” forgetfulness</td>
<td>Moderate memory loss; more marked for recent events; defect interferes with everyday activities</td>
<td>Severe memory loss; only highly learned material retained; new material rapidly lost</td>
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<tr>
<td><strong>Secondary categories</strong></td>
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<tr>
<td><strong>Orientation</strong></td>
<td>Fully oriented</td>
<td>Fully oriented except for slight difficulty with time relationships</td>
<td>Moderate difficulty with time relationships; oriented for place at examination; may have geographic disorientation elsewhere</td>
<td>Severe difficulty with time relationships; usually disoriented to time, often to place</td>
<td></td>
</tr>
<tr>
<td><strong>Judgment and problem solving</strong></td>
<td>Solves everyday problems and handles business and financial affairs well; judgment good in relation to past performance</td>
<td>Slight impairment in solving problems, similarities, and differences</td>
<td>Moderate difficulties in handling problems, similarities, and differences; social judgment usually maintained</td>
<td>Severely impaired in handling problems, similarities, and differences; social judgment usually impaired</td>
<td></td>
</tr>
<tr>
<td><strong>Community affairs</strong></td>
<td>Independent function at usual level in job, shopping, and volunteer and social groups</td>
<td>Slight impairment in these activities</td>
<td>Unable to function independently at these activities although may still be engaged in some; appears normal to casual inspection</td>
<td>No pretense of independent function outside home; appears well enough to be taken to function outside a family home</td>
<td></td>
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<tr>
<td><strong>Home and hobbies</strong></td>
<td>Life at home, hobbies, and intellectual interests are well-maintained</td>
<td>Life at home, hobbies, and intellectual interests slightly impaired</td>
<td>Mild but definite impairment in function at home, more difficult chores abandoned, more complicated hobbies and interests abandoned</td>
<td>Only simple chores preserved; very restricted interests, poorly maintained</td>
<td></td>
</tr>
<tr>
<td><strong>Personal care</strong></td>
<td>Fully capable of self-care</td>
<td>Fully capable of self-care</td>
<td>Needs prompting</td>
<td>Requires assistance in dressing, hygiene, keeping of personal effects</td>
<td></td>
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</tbody>
</table>
Evaluate for risk factors

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>CDR 0.5-1.0</th>
<th>CDR 2.0</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level B evidence</strong></td>
<td></td>
<td></td>
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<tr>
<td>Caregiver report of marginal or unsafe skills</td>
<td></td>
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<tr>
<td>History of citations</td>
<td></td>
<td></td>
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<tr>
<td>History of crashes</td>
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<tr>
<td><strong>Level C evidence</strong></td>
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<tr>
<td>Driving &lt; 60 miles / week</td>
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<tr>
<td>Situational avoidance</td>
<td></td>
<td></td>
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<tr>
<td>Aggression, impulsivity</td>
<td></td>
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<tr>
<td>MMSE ≤ 24</td>
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<tr>
<td><strong>Other</strong></td>
<td></td>
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<tr>
<td>Alcohol, medications, sleep disorders, visual impairment, motor impairment</td>
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</tbody>
</table>

Risk factors:
- None
  - CDR 0.5
  - CDR 1.0

- Few
  - CDR 0.5
  - CDR 1.0

- Several
  - CDR 0.5
  - CDR 1.0

- Multiple
  - CDR 0.5

Relatively low risk

Relatively high risk

Risk Management
- Encourage family support for alternate transportation.
- Strongly consider voluntary surrender of driving privileges.
- Consider DMV referral or professional driving evaluation, based on state guidelines.

Intervention pursuant to state guidelines
AAN also noted...

- Other factors found to be associated with increased risk of unsafe driving:
  - Caregiver’s rating of driving
  - History of traffic citations (last 3 yrs)
  - History of crashes (last 3 yrs)
  - Reduced driving mileage
  - Self-reported situational driving avoidance
  - Impulsive, aggressive personality
Goals, often in competition, include:

- patient safety
- safety of others
- patient independence
- patient confidentiality
After the office evaluation…

- One of the following steps:
  - No concern for medically impaired driving ➔ revisit periodically.
  - Some concern for medically impaired driving in an area clearly identified ➔ attempt to optimize older driver’s safety.
  - Some concern for medically impaired **driving**, but further information needed ➔ refer to OT, PT, neuropsych, etc., for evaluation.
  - In your estimation, **patient cannot drive safely** ➔ counsel patient on driving cessation.
Optimizing the older driver

- If you identify an area of concern:
  - Evaluate
  - Diagnose
  - Treat
  - Retest
Optimizing the older driver

- Visual deficits may be correctable → refer to an ophthalmologist/optometrist.
- Limited mobility → refer to occupational therapy.
- Insufficient strength → recommend exercises, refer to physical therapy.
- For any condition, on-road assessment may be indicated.
Optimizing the older driver

- Cognitive impairment may be more difficult to optimize.
  - Any concerns should prompt on-road assessment.
  - In most cases of dementia, rehabilitation potential is vanishingly small.
  - Consider referral to a certified driving rehabilitation specialist.
Thank you for driving carefully through the village.
What do we do…

…when the time to give up driving is at hand or clearly approaching?
Who makes the determination?

- Patient
- Family/caregiver
- Community (DMV, sheriff)
- Health care providers
Counseling driving cessation

- Use the term “driving retirement”.
- Stay away from “if”, use “when”.
- Tell the patient that you do not have the legal authority to take a license away.
- Involve the patient in the decision to the extent possible.
Tell the patient your plan:
  o Make a recommendation to the patient
  o Write a letter to the DOT

Avoid disputes and long explanations, but give the patient an adequate explanation.
Counseling driving cessation

- Assist in creating an alternative transportation plan.
- Put a positive spin on giving up driving.
  - But acknowledge the difficulties
- Refer the patient to the local Area Agency on Aging.
Counseling driving cessation

- Write a prescription with the words “Do Not Drive”.
- Involve caregivers in the discussion
- Send the patient a follow-up letter.
- Arrange a follow-up appointment to:
  - Assure that the patient is not driving.
  - Determine if transportation needs are being met.
  - Assess the patient for signs of isolation and depression.
Driving assessment in SE Iowa

- Genesis, Davenport – 563-4211474
- Mercy, Cedar Rapids – 319-861-7778
- St Luke’s, Cedar Rapids – 319-369-7331

All have certified driving rehabilitation specialists
Iowa Motor Vehicle Division on the web at www.dot.state.ia.us/mvd, or 1-800-532-1121
Resources


Other resources

- National Center on Senior Transportation: http://seniortransportation.easterseals.com/site/PageServer?pagename=NCST2_homepage
- AARP: http://www.aarp.org/home-garden/transportation/we_need_to_talk/