Dementia and Driving

Mark Rapoport, MD, FRCPC

Presented by: ***Ontario's Geriatric Steering Committee***

With Appreciation

Disclosures

- CIHR
- CIHR/CCNA
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- PSI
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Learning Objectives

Dementia & Driving (Mark Rapoport)

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Learning Objectives

- To understand limitations in accurately detecting dementia.
- To appreciate the literature pertaining to the magnitude of driving risks with dementia, and detecting these risks.
- To appreciate potential negative consequences of driving cessation in dementia and of screening for dementia among drivers.
- To learn about physicians' decision-making about reporting patients with mild dementia to transportation authorities.

Older drivers

- Fastest growing segment of licensed population
- Vast majority continue to be safe to drive
- Often unfairly characterized by the media

Driving

- THE ULTIMATE IADL

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Detecting Dementia

Test (cut-off)	Age		65-74	75-84	85+
	% Prevalence		2.4	11.1	34.5
MMSE (23/24)	Sn 79%	PPV	15%	45%	80%
	Sp 88%	NPV	99%	97%	90%
MoCA (25/26)	Sn 100%	PPV	15%	50%	80%
	Sp 87%	NPV	100%	100%	100%
Mini-Cog	Sn 76%	PPV	15%	45%	80%
	Sp 89%	NPV	99%	97%	90%
GPCOG	Sn 85%	PPV	10%	40%	75%
	Sp 86%	NPV	99%	90%	90%

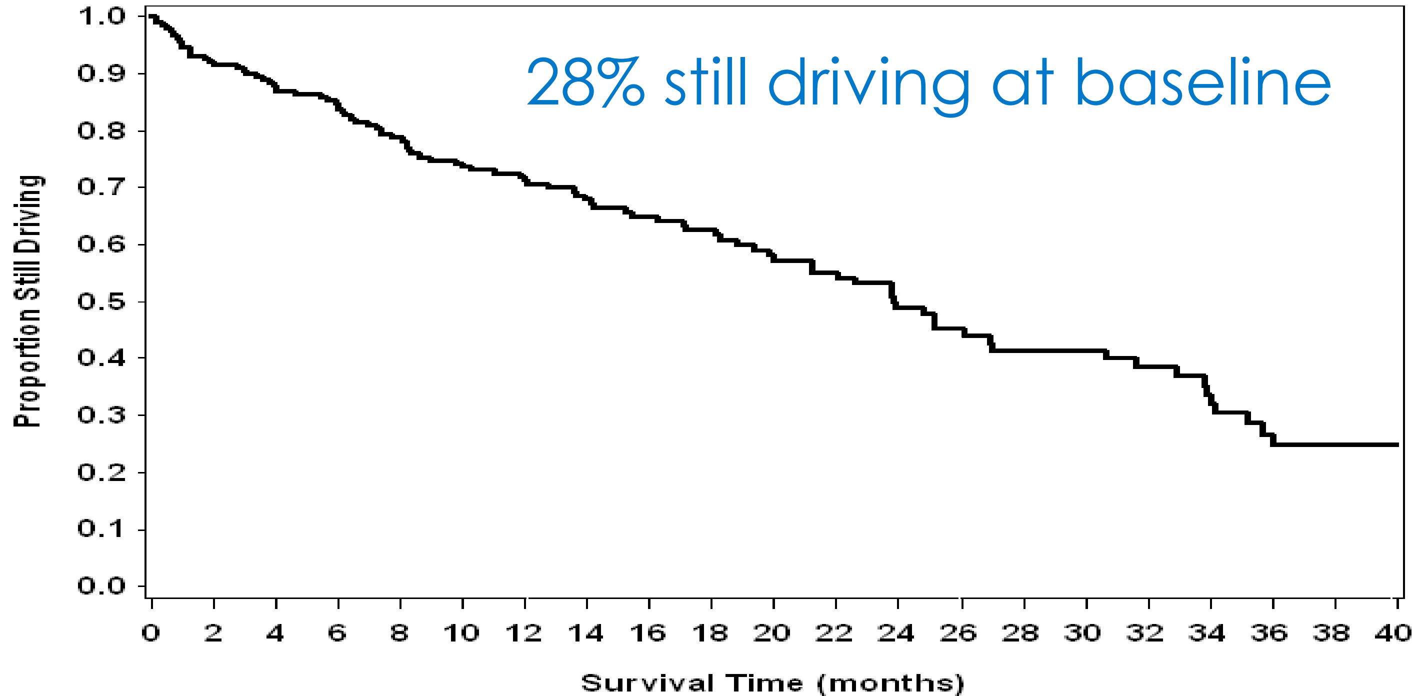
Wiens, A., Geriatric Psychiatry Review (In Press)

Studies of Crash Risk in Dementia

- Systematic review 2007
- 6 studies, 2 of highest quality (8/9 on Ottawa-Newcastle)
    - BC: Cooper et al, 1993
        - Drivers with at least one collision 43 (26.1%) dementia vs 19 (11.5%) comparison.
    - Michegan: Trobe et al, 1996;
        - Event Rate/ Driver years 0.08 crashes/driver years in dementia AND comparison

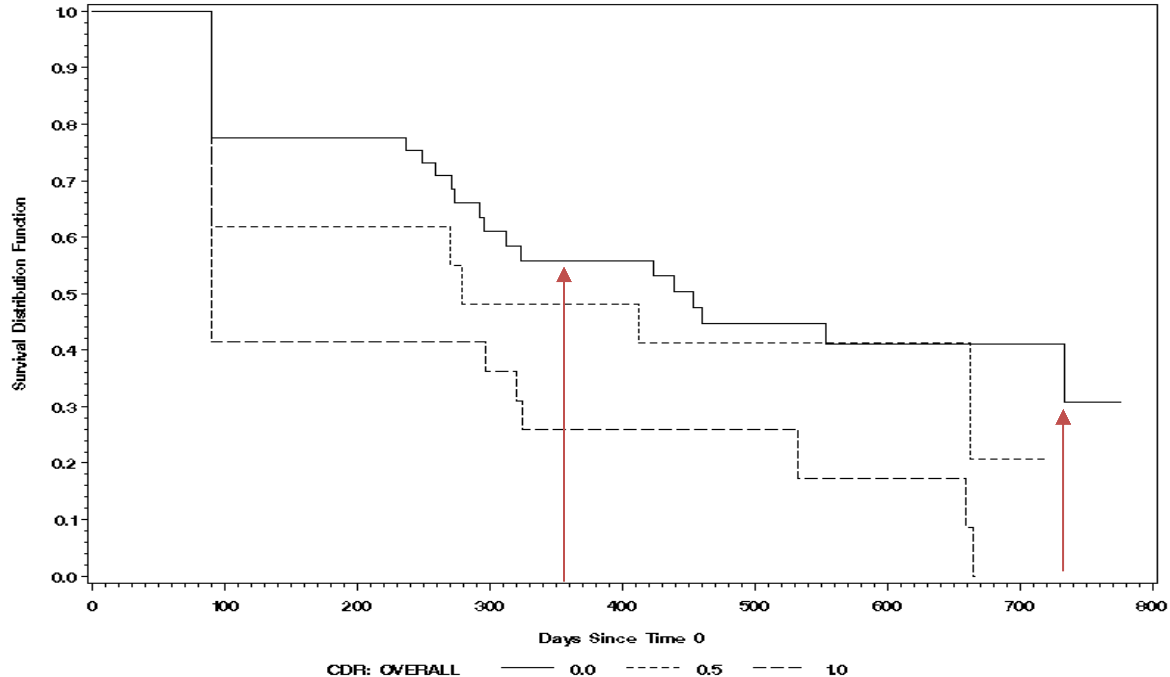
Man-Son-Hing et al, J Am Geriatr Soc 55:878–884, 2007
Cooper et al Journal of Safety Research Vol. 24, 9-17, 1993
Trobe et al, Arch Neurol. 1996;53:411-416, 1996

Proportion of Active Drivers with Mild-Moderate Dementia



Herrmann, Rapoport, Sambrook et al CMAJ 2006, 175 (6)

Longitudinal Findings: Time to Receive a Rating of ‘Unsafe’ on the Driving Test by CDR Group



Duchek et al., J Am Geriatr Soc 2003;51:1342-1347

Persistence!

- Many patients with mild dementia continue to drive.
- Those that continue to drive persist for years while dementia progresses, and driving deteriorates.
- Behavioral factors may be more significant than cognitive ones wrt driving cessation.

Dementia and Driving

- The diagnosis of dementia does <u>*not*</u> automatically mean *no driving (some people with mild dementia can drive albeit for a limited period of time before they must hang up the keys)*

- The diagnosis of dementia *does mean*:
  - You <u>must</u> ask if the person is still driving
  - You <u>must</u> assess and document driving safety and follow your provincial reporting requirements
  - If safe to drive, you <u>must</u> reassess fitness-to-drive every 6 months
  - You <u>should</u> start to counsel regarding eventual '<u>*driving retirement*</u>' as early as possible to allow the patient to process, adjust and prepare

Patient, Family, Doctor

	Self-rating	Informant Rating	Physician Rating
Correctly classified	53.2	64.4	74.0

Brown et al, JAGS 2005

Cognitive Testing: The Findings

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MMSE and Driving– Systematic Review

(Molnar et al, JAGS 54, 1809-1824, 2006)

Positive Association	No Association	N w dementia	Outcome	Cutoff?
	Friedland 1988	30	Reported MVCs	No
	Lucas-Blaustein 1988	53	Reported MVCs	No
	Gilley, 1991	333	Reported MVCs	No
Trobe 1996		143	Database MVC	No
Rebok 1994		10	Simulator score	No
Harvey 1995		13	Simulator score	No
Cox 1998		17	Simulator score	No
	Fitten 1995	12	On-road score	No
Fox 1997		19	On-road score	No
	Bieliauskas 1998	9	On-road score	No

Selected other in-office tests and driving

- Blessed Dementia Rating Scale
- Trails A
- Digit Span; Digit Sy
- Block Design
- Logical Memory Te ... al Retention Test
- Trails B; Picture Arra
- Category F
- Boston Na ng Test

Problems:
No cut-offs
None consistently predict

(Molnar et al, JAGS 54, 1809-1824, 2006)

Caveat with Cog Testing as Screen

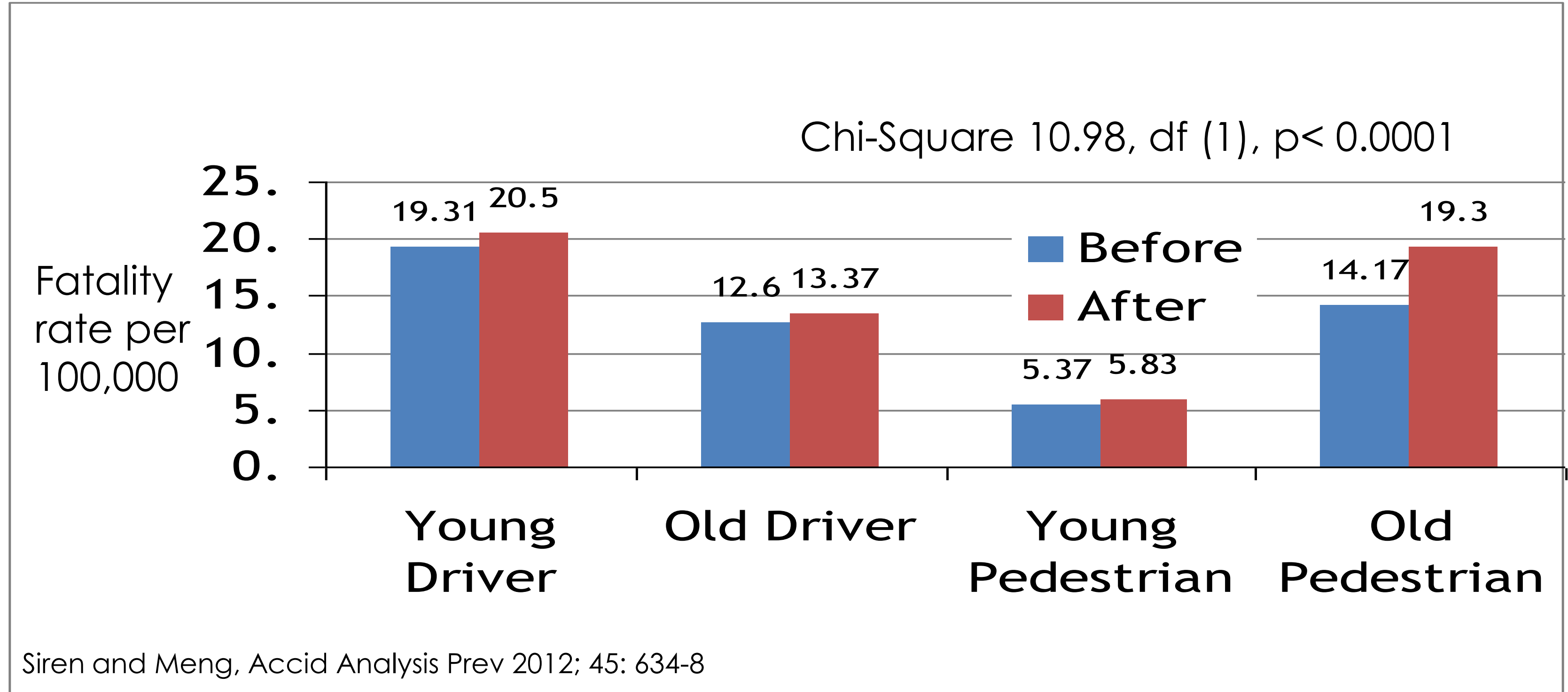
- Data from large prospective cohort study re-analyzed.
- Cognitive Predictors: UFOV, Trails B, Delayed Recall and Motor Free Visual Perception Test (Visual Closure) (MVPT-VC)
- Highest OR was for MVPT-VC 4.96
- MVPT/VC of 5 or more correctly predicted 18 crashes, had 258 false positives, 93 false negatives and 1503 true negatives in the 1872 participants who had valid test results.
- PPV of 93%, NPV of 94%, 83% Sensitivity, 85% specificity.
- Need to screen 143 older drivers in order to prevent one crash in the following 20 months
- …and an additional 20 drivers will fail testing

Staplin (2003) and Martin, Marottoli and O'Neil (2009)

The Trails B debate

- Roy M, Molnar F. Systematic review of the evidence for Trails B cut-off scores in assessing fitness-to-drive. Canadian Geriatrics Journal Sept 2013
  - 47 articles reviewed
  - Cut-off scores reported based on research include: 90 seconds, 133 seconds, 147 seconds, 180 seconds and 3 errors
  - Conclusion: the best available evidence supports the "3 or 3 rule' for reporting patients to the ministry of transportation as having findings that might impact on driving
    - This is not the same as a final determination of fitness-to-drive
    - Trails B findings should be felt to reflect true function (consistent with other tests and/ or history; not altered by language, anxiety, learning disability…)
  - Conclusion; more and better research needed including ROC analysis of sensitivity vs. specificity for various cut-offs.

Screening at the Government Level



Decision Making about Driving

- Balancing safety and quality of life

Driving Cessation

- Psychosocial consequences
  - Depression
  - Social isolation
  - Loss of self esteem
  - Many report “worse than death”
  - Impact on patient/physician relationship

Dementia and Driving in Ontario Study Rapoport et al (2014) Am J Geriatric Psychiatry

The working differential diagnosis is mild Alzheimer's disease vs. mild cognitive impairment

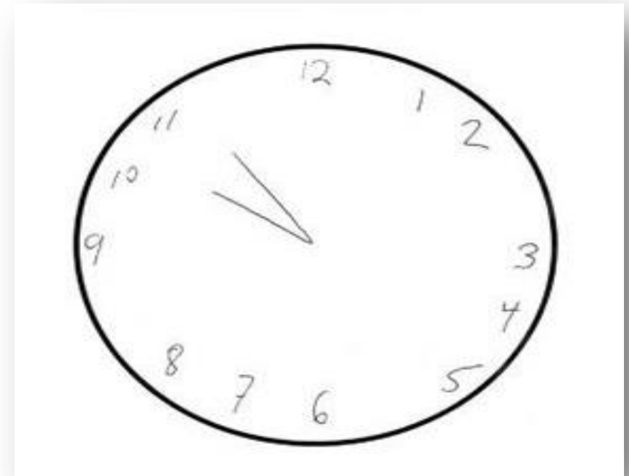
Crashes

Caregiver

concern

Cognitively slow

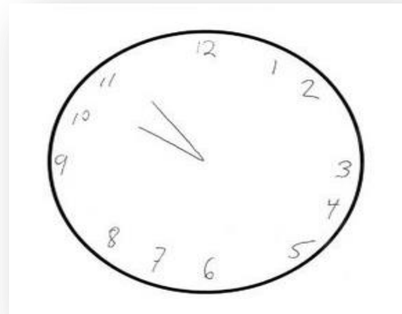
Irritable
Abnormal Clock

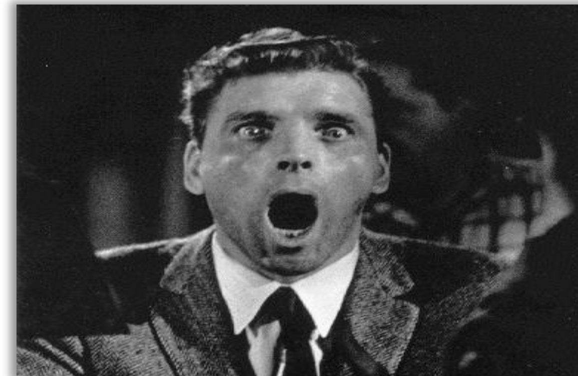


Predictive Model

The combination of Abnormal Clock and Caregiver Concern accounted for:

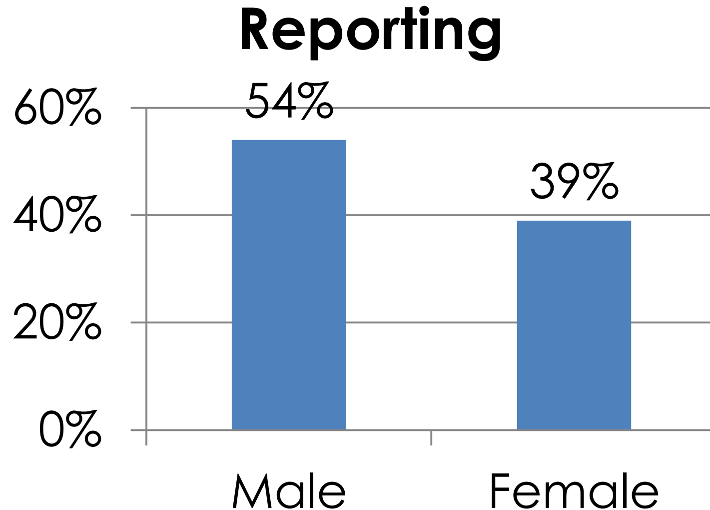
- 62% of the variance in "report with or without a road test" (C or D)





Rapoport et al, AJGP, 2014

Physician Factors



- Sex 15.1% of variance
- Sex with risk-taking and uncertainty stress 27.7% of variance

Rapoport et al, JAGS 2013

Ongoing Research

- Driving Cessation Intervention in Dementia
- Knowledge Synthesis on Driving with Dementia (and TBI)
- Driving and Dementia Decision Tool
- Candrive Common Cohort Study

What's New in Ontario

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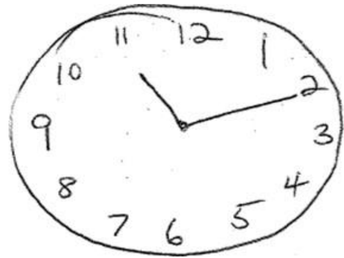
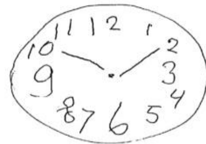
MTO Senior Driver Changes 01/2014

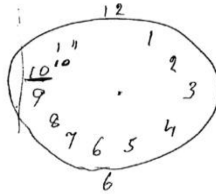
- Based on an extensive operational review of Ontario's existing senior licensing program, the Ministry made the following changes:
  - Eliminate the knowledge test;
  - Introduce two brief screening tools to objectively and more effectively identify drivers who may need to take a road test or see their physician;
  - Shorten and improve the educational session; and,
  - Ensure minimum vision requirement is met at 20/50.

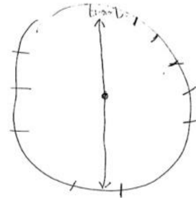
Recommended Cognitive Screening

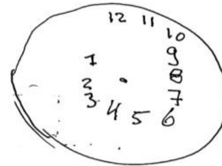
Clock Drawing Test











Ten after eleven

Letter Cancellation Test (letter H)

H I H B D A H C F B H D E H D A F H I C H
F H A D H C E H I H G D H G E B H E G H I
H G H C G D H C B A H G D E H C H B E H D
E B F H C D H F H G E H B H D H F A C H C
H I H E B H G F B H F A H E B G H G F E H
B H I G E H G H D E H C G H D H E B A H F

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CST Decision Tree

Clock Drawing Test

Scoring: For a total of 7 points, award 3 points for time, 2 points for numbers, 2 points for spacing.

Thresholds:

3-7 points = pass

1-2 points = moderate fail (M-fail)

0 points = extreme fail (X-fail)

Letter Cancellation Test

Scoring: Calculating the number of omissions (i.e., "H"s that were not crossed out).

Thresholds:

0-5 omissions = pass

6-10 omissions = moderate fail (M-fail)

11+ omissions = extreme fail (X-fail)

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2015, Bill 31, Ammendment to HWY 401 and Highway Traffic Act

- Previously doctors "***Shall*** report …. every person … who, in the opinion of the doctor …suffers from a condition that ***may*** make it dangerous for the person to drive."

- Now: "The… persons will be required to make a ***mandatory*** report if a person ***has or appears to have a prescribed medical condition, functional impairment or visual impairment.*** In addition, a pre-scribed person ***may make a discretionary report*** if a person has a medical condition, functional impairment or visual impairment that the prescribed person believes ***may*** make it dangerous for the person to drive."

- List pending

Practical Suggestions

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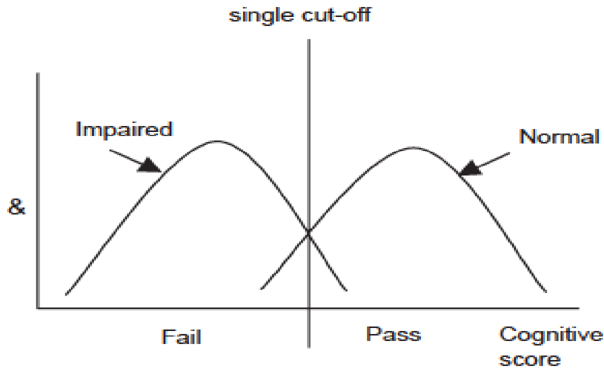
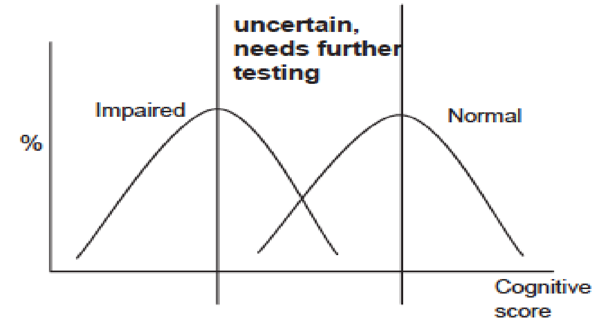
Rational Use of Cognitive Testing

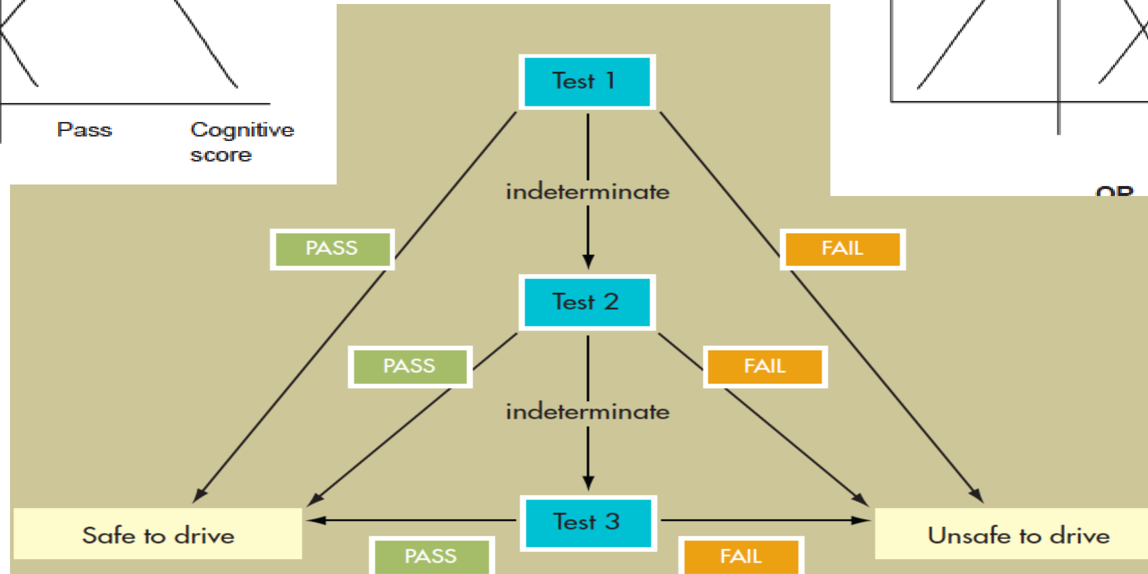
- Are the test results consistent with other clinical evidence?
- What are we really measuring?
- What is the trajectory?
- What is my duty?
- Common sense
- Qualitative and dynamic aspects of testing.
- Trichotomization

Molnar, F.J., Rapoport, M.J., Roy, M. (2012) CGS CME.

Cut-offs







Molnar F, et al. Clinical Medicine: Geriatrics 2008: 2; 1-11
Molnar F, et al. Geriatrics and Aging 2009; 12: 83-92

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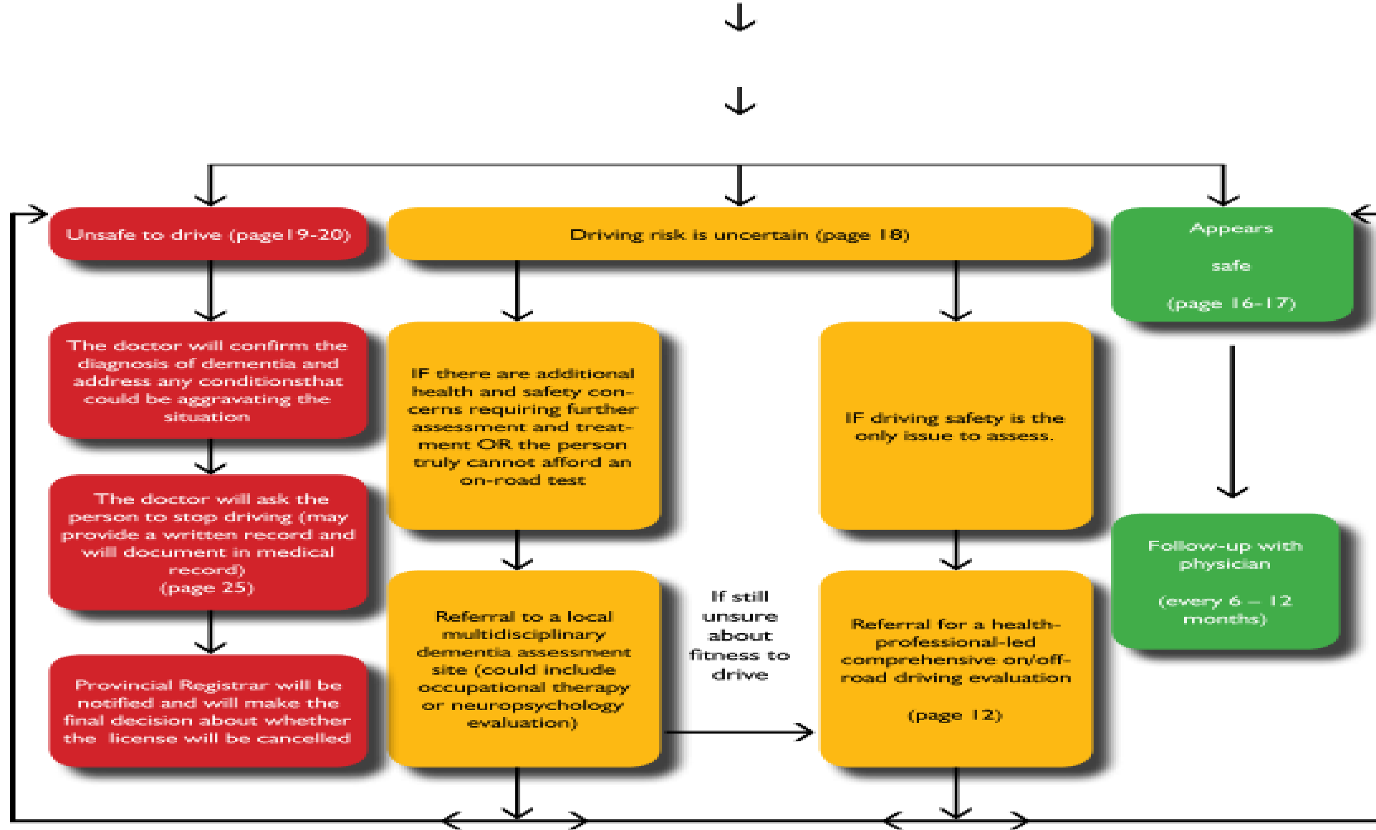

Byszewski, Dementia and Driving Toolkit (online resource. www.Rgpeo.com)

Important Steps

- Document re: Driving
- Ask Family
- Review cognition, behavior, function, hearing, motor, and sensory function
- Rule out significant dangerous medical conditions (eg. Seizure disorder, sleep apnea, stroke, PD), medications (esp anticholinergic) and substances
- Decide on referral for specialized testing
- Give feedback

Disclosure

1. Preparatory meeting with family.
   - Set ground rules/educate
   - Put family in a supportive role.
   - Address family resistance
2. Meeting with patient and family
   - Ground rules and educate
   - Give patient positive role.
   - Address patient resistance
3. Post-disclosure
   - Letter
   - Documentation
   - Alternate transportation plans
   - Dealing with difficult situations

Molnar, Byszewski, Rapoport, Dalziel, Geriatrics & Aging, 2009

Summary

- Not the same as driving in the elderly.
- Many cognitive skills required.
- Dementia increases crash risk, but also decreases exposure. Not enough info.
- Drivers with dementia are persistent.
- Detection of dementia is imprecise, and even more so is detection of driving impairment in dementia.
- Driving cessation has negative consequences.
- Many patients in the early stages may be safe to drive.
- Cognitive testing limited predictive ability. We need better tools.
- Individualized assessment needed. We need to make this practical and affordable.
- Many challenges regarding physician reporting, esp in balance between safety and autonomy.

Thank you!

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