

# **DRIVING AND DEMENTIA**



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# **Conflict of Interest**

- **None**

# **Learning Objectives**

- **By completion of this session, you will be familiar with:**
  - 1. Driving risk associated with dementia**
  - 2. Guidelines regarding dementia and driving**
  - 3. Approaches to the assessment of fitness to drive in persons with dementia**
  - 4. Approaches to breaking the news**

# Older Drivers



# Older Drivers

- **Drivers 65+ are the fastest growing segment of the driving population**
- **In 2009, 68% of men and 24% of women 85-89 and 37% of men and 11% of women 90+ were still driving**
- **By 2030, older drivers will make up 1 in every 4 drivers**

**Freeman et al. J Public Health 2006;96:1254-1259**

**Gardezzi et al. Clin Gerontol 2006;30:5-22**

**Turcotte. Statistics Canada 2012**

**AARP 2002**

# **Most Older Drivers are Safe Drivers**

- **Older drivers have lower rates of crashes per capita than younger drivers**
- **Less likely to drink & drive**
- **Less likely to speed or disobey signs**
- **More likely to self-limit their driving as they age**

**.....But.....**

# Motor Vehicle Crashes Per Mile Driven

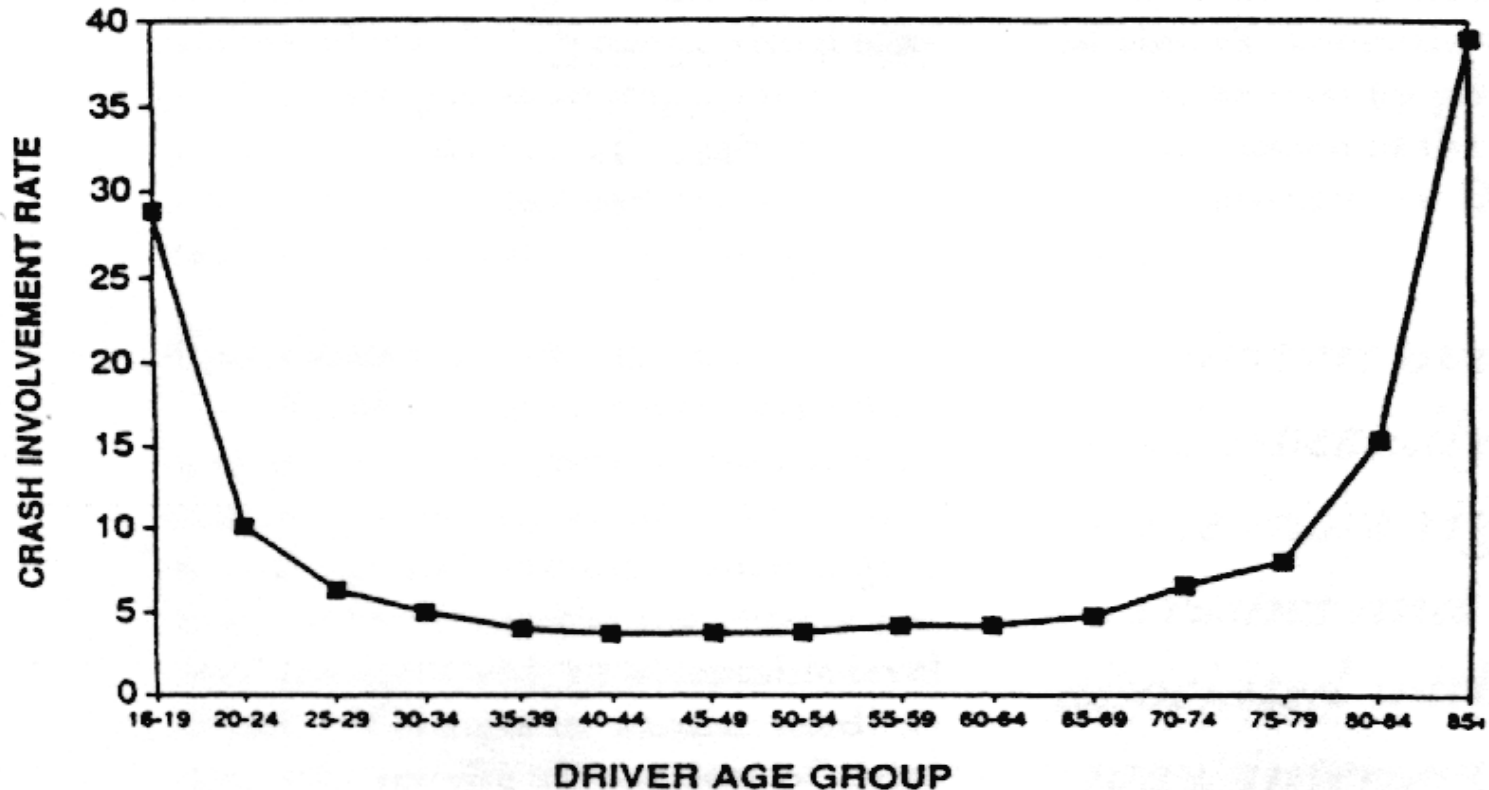
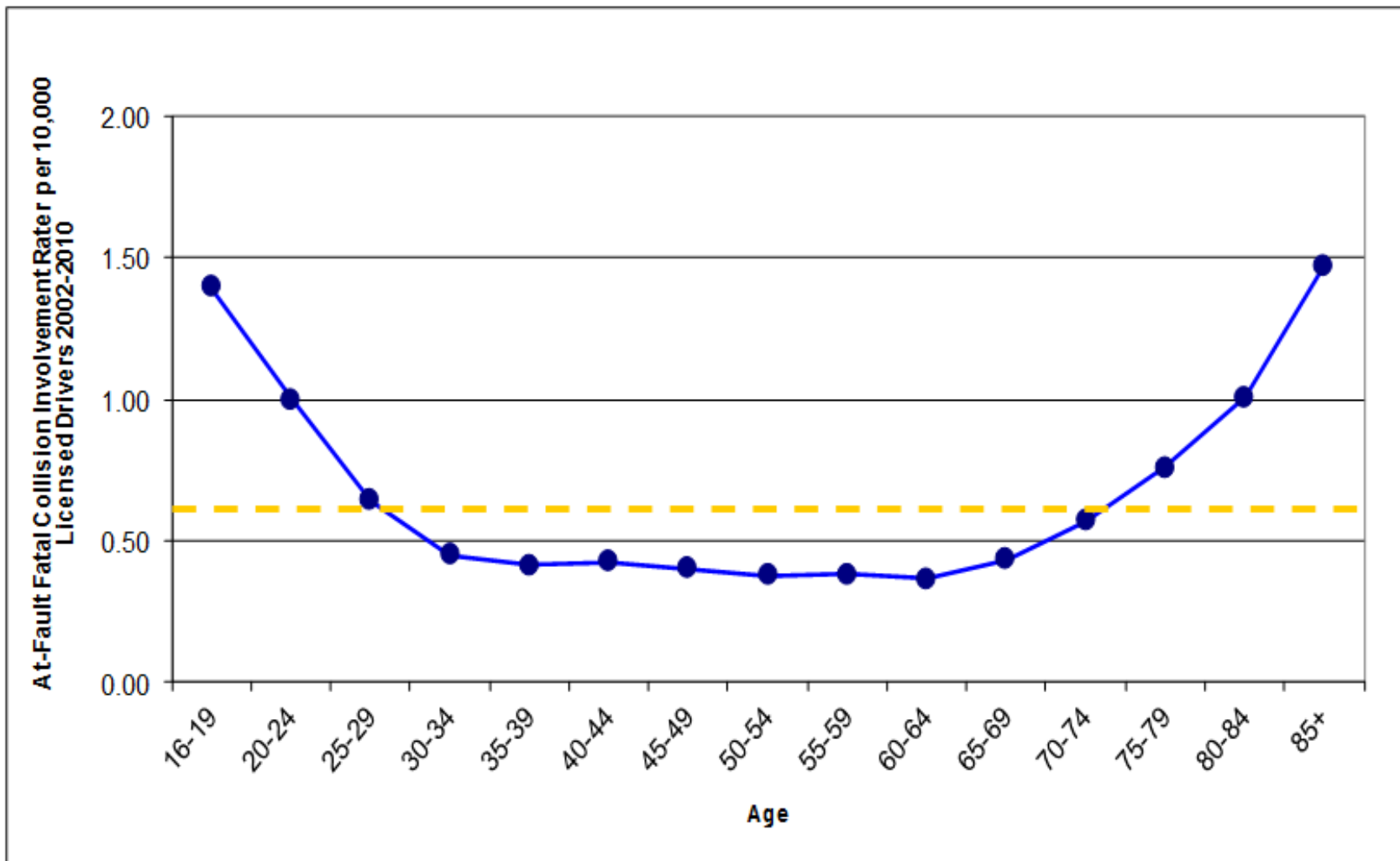


Figure 2. Rate of Motor vehicle crashes adjusted for miles driven according to driver's age. SOURCE: Cerrelli E. *Older Drivers: The Age Factor in Traffic Safety*. Washington, DC: US Department of Transportation, National Highway Traffic Safety Administration, 1989

# Driver Age and Risk of At-Fault Collision





# **Older Drivers – Crashes**

- **Medical conditions are the primary cause of declines in sensory, physical and cognitive abilities that negatively impact driving competence**

**Carr. Am Family Phys 2000;61:141-148**

# **Medical Conditions – Driving Risk**

- **Eye conditions**
- **Neurologic disease (dementia, PD, MS, TBI, stroke, SC injury)**
- **Cardiovascular disease**
- **Metabolic disease (DM, hypoT4)**
- **Respiratory/sleep conditions (COPD, OSA)**
- **MSK/pain conditions**
- **Psychiatric illness**
- **Chronic renal failure**
- **Cancer**

# Red Flag Medications

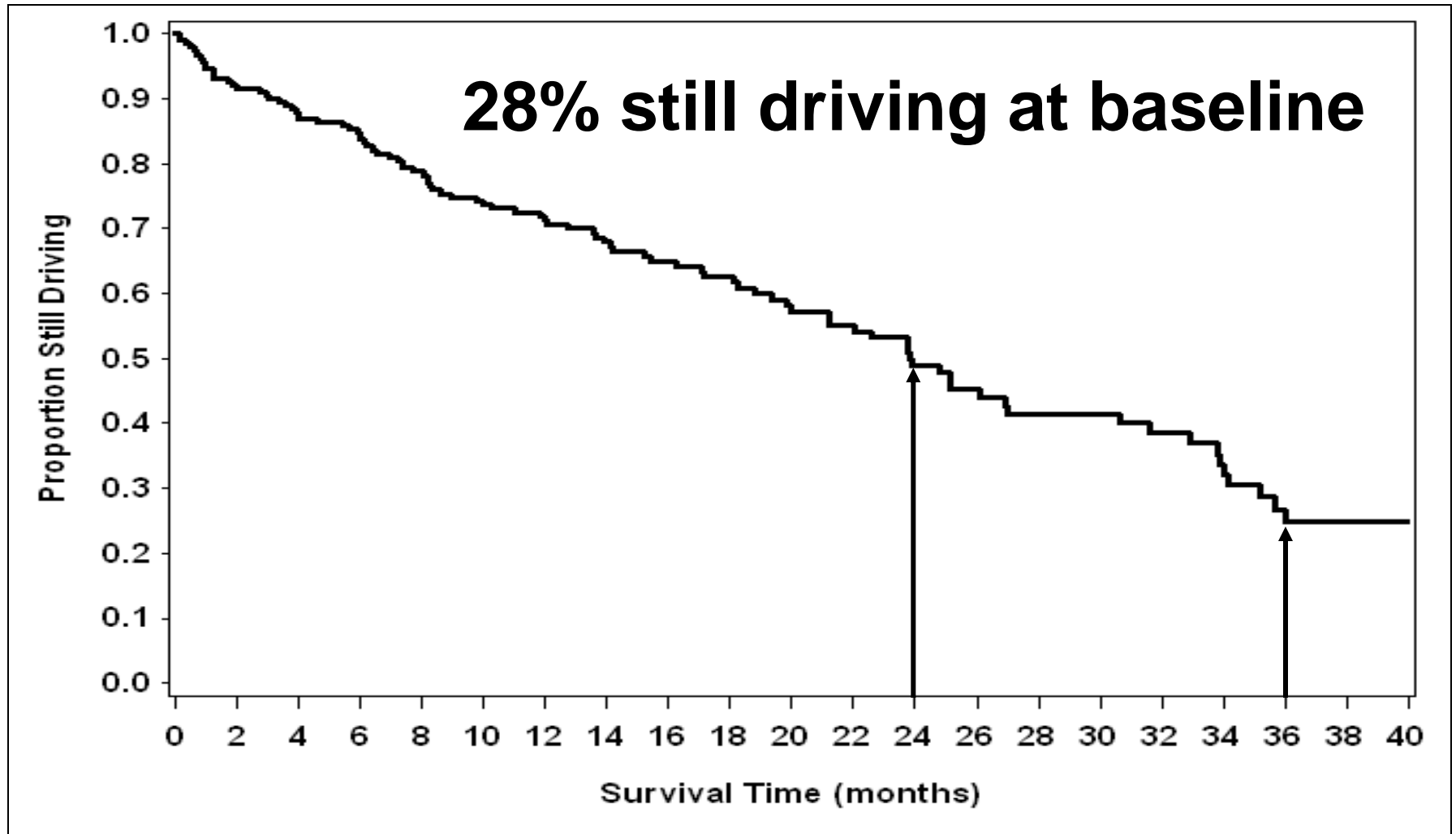
- **Anticholinergics**
- **Anticonvulsants**
- **Antidepressants**
- **Antiemetics**
- **Antihistamines**
- **Antiparkinsonian Agents**
- **Antipsychotics**
- **BZDPs/Hypnotics/Sedatives/Anxiolytics**
- **Narcotic Analgesics**
- **Muscle Relaxants**
- **Stimulants**



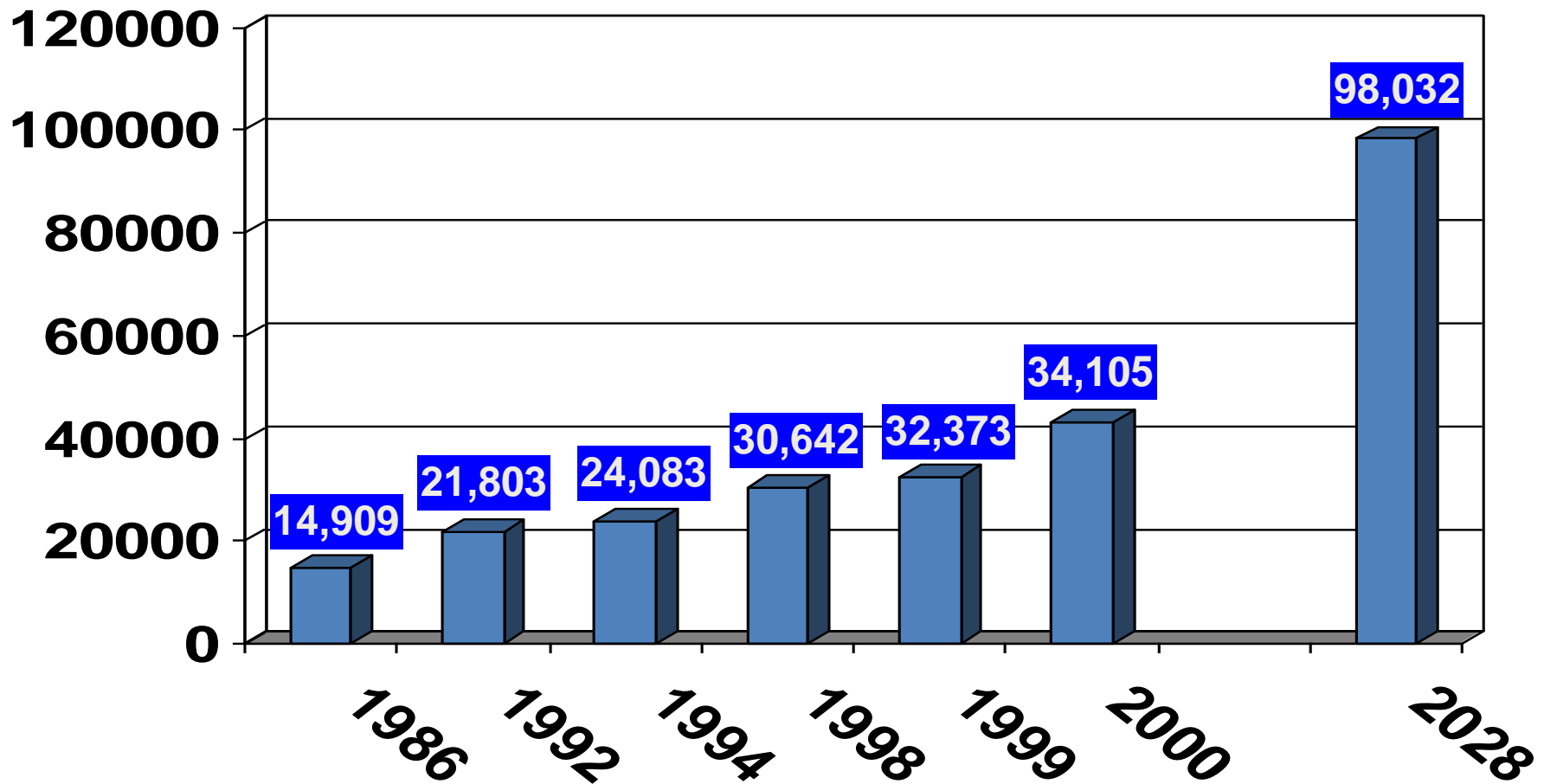
# Driving and Dementia



# COSID - Proportion with Mild-Moderate Dementia Still Driving



# Estimated Numbers of Drivers with Dementia in Ontario



# Driving Performance in Dementia

- **Systematic Review; predominately very mild-mild AD**
- **17 studies of driver performance**
  - 11 used on-road evaluation
  - 4 used simulator evaluation
  - 1 used caregiver report
  - 1 used traffic sign test
- **All 17 found that drivers with dementia performed significantly worse than controls**

Man-Son-Hing et al. JAGS 2007;55:878-84

# Crash Risk in Dementia

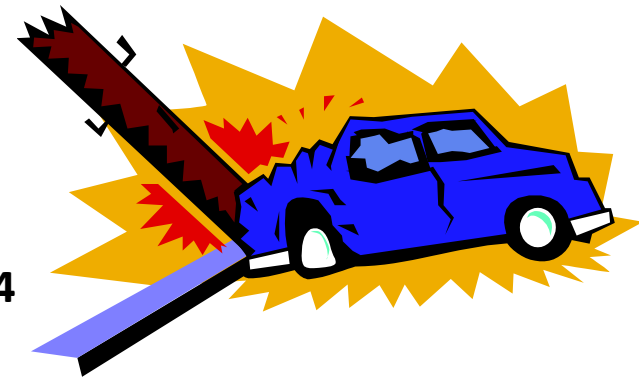
- 3/3 studies of caregiver-reported crashes found that drivers with dementia crashed more often than controls

– 2.3x, 7.9x, 10.7x



- 2/5 studies of state driving records of crashes found drivers with dementia crashed more often than controls

– 2x, 2.5x





# Driving Performance in Dementia

- **Systematic review updated since 2004**
- **6/7 studies found significant group differences (medium to large effects) indicative of decreased performance in at least 1 measure of driving behavior for the persons with dementia**
- **Persons with dementia were much more likely to fail a road test (RR: 10.8, 95% CI:3.0-38.6)**

**Chee et al. Am J Geriatr Psychiatry 25:12, 2017**

# Crash Risk in Dementia

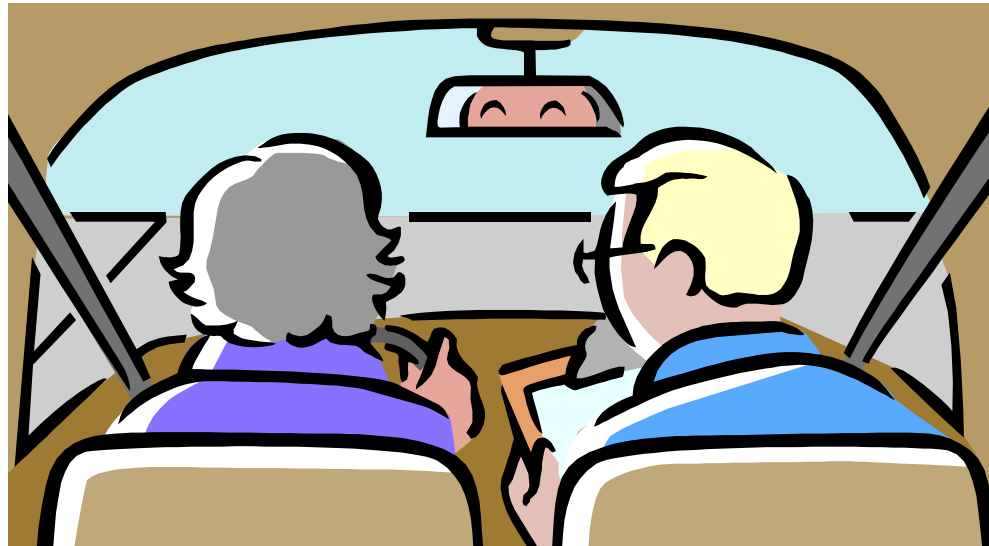
- **2 studies reported on self/informant-reported and state reported MVC risk**
- **CDR 0.5 and 1 vs. controls**
  - **1 showed a 4.72 x increase in MVCs per 1,000 miles driven in 3 years prior**
  - **1 showed no significant increase in MVCs in 3 years prior**

**Chee et al. Am J Geriatr Psychiatry 25:12, 2017**

# Driving Performance in AD

- **Systematic review of driving competence in people with AD**
- **23 studies using on-road driving tests; 9 simulator studies**
- **15-65% failed on-road driving assessment**
- **More overall driving errors; lane maintenance, lane changing, turning (esp. left), maintaining road speed, stopping appropriately, avoiding collisions; less attention, slower decision-making**
- **Driving performance decreased with increasing dementia severity**

# On-Road Driving Performance



# On-Road Driving Performance

## Pooled Data

	Controls (n=102)	V. Mild AD (n=73)	Mild AD (n=61)
Clear Pass	79%	49%	37%
Marginal	19%	38%	31%
<i>Fail</i>	<i>2%</i>	<i>13%</i>	<i>32%</i>

Duchek et al. JAGS 2003;51:1342-1347

Ott et al. Neurology 2008;70:1171-1178

# On-Road Driving Performance (cont'd)

	No Dementia (n=4)	V. Mild AD (n=26)	Mild AD (n=66)
Pass	100%	65%	42%
<i>Fail</i>	<i>0%</i>	<i>35%</i>	<i>58%</i>

Berndt et al. Australian J Ageing 2008;27:157-160

# MCI: Proportion of Participants Receiving Less Than Optimal Ratings

	<b>Controls (n=59)</b>	<b>MCI (n=46)</b>	<b><i>P</i>- Value</b>
Right turn	12 (20.3)	10 (21.7)	.861
<b>Left turn</b>	<b>22 (37.3)</b>	<b>27 (58.7)</b>	<b>.029</b>
<b>Lane control</b>	<b>8 (13.6)</b>	<b>18 (39.1)</b>	<b>.003</b>
Gap judgment	14 (23.7)	18 (39.1)	.089
Steer steadiness	24 (40.7)	24 (52.2)	.241
Maintaining speed	21 (35.6)	24 (52.2)	.088
<b>Global rating</b>	<b>11 (18.6)</b>	<b>20 (43.5)</b>	<b>.006</b>

# **MCI - On-Road Driving Performance**

- **Subtle functional decrements in discrete and overall driving skills in persons with MCI**
- **The greatest disparities between groups were in maintaining lane control and making left-hand turns**
- **The performance decrements did not rise to the level of frank driving impairments**

**Wadley et al. J Geriatr Psychiatry 2009;22:87-94**

**Anstey et al. J Alz Dis 2017;57:1197–1205**



# Can Cognitive Assessments Identify Unsafe Drivers?



# Cognitive Predictors of Driving Fitness

- **Systematic review of 27 studies that correlated driving performance with neuropsychological tests in *drivers with very mild or mild dementia***
- **Visuospatial and executive measures had strongest correlations with driving impairment**
  - **UFOV (a computer-based test of divided and selective attention), Porteus Maze (assesses ability to plan and problem solve), Trails B, Clock Drawing**
- **MMSE did not predict future crashes or traffic violations**

# **Cognitive Predictors of Driving Fitness (cont'd)**

- **Critical appraisal of 17 measures identified in systematic review of office-based tools that could be used by OTs to assess fitness to drive**
- **Useful Field of View (UFOV) only tool rated “excellent”; predicts crash history, future crashes and on-road performance**
- **Motor-free Visual Perception Test (MVPT; a measure of understanding spatial relationships) rated “adequate”; less rigorous evidence supporting its utility at predicting on-road performance**
- **MMSE and CDT rated “adequate”; limited evidence with respect to cut scores**
- **None of the measures should be used as a stand-alone determinant of driver fitness**

# **Cognitive Predictors of Driving Fitness (cont'd)**

- **Systematic review of 28 papers that included standardized cognitive measures and a measure of driving ability including participants with dementia diagnosed using accepted diagnostic criteria**
- ***Variable associations with driving performance for all individual cognitive measures and for each of the cognitive domains***
- ***Almost no cut-off scores provided for use at individual level***

# Cognitive Predictors of Driving Fitness (cont'd)

<b>COGNITIVE DOMAIN</b>	<b>+VE ASSOCIATION WITH DRIVING</b>
<b>General Cognitive Status</b>	<b>23/41 (56.1%)</b>
<b>Executive Function</b>	<b>20/39 (51.3%)</b>
<b>Attention &amp; Concentration</b>	<b>13/27 (48.1%)</b>
<b>Visuospatial Skills</b>	<b>10/21 (47.6%)</b>
<b>Memory</b>	<b>7/19 (36.8%)</b>
<b>Language</b>	<b>1/9 (11.1%)</b>

Bennett, JM et al. JAGS 2016

# MoCA Trichotomization Approach

- People referred for driving assessment by licensing authority, healthcare providers, self-referral
- Those presenting with self-indicated cognitive problems were assessed with a MoCA
- 5 groups with neurological problems (n=135): dementia (n=50), stroke (n=39), brain injury (n=17), MS (n=16), and PD (n=13)
- 81 passed the driving assessment and 54 failed
- Two cutoff points observed on ROC analysis (AUC .815, 95% CI 0.744-0.887): MoCA<12 and >27
- MoCA<12 very accurate at picking up fails (100%), but not specific to pick up passes (16.7%)
- MoCA>27 specific to pick up passes (100%), but not accurate to pick up fails (4.9%)
- Trichotomization: MoCA>27 safe, MoCA<12 unsafe, and MoCA 12-27 indeterminate and need further driving assessment

# Driving and Dementia: Guidelines



A CMA Company  
Société de l'AMC

joule

# Determining medical fitness to operate motor vehicles



Dr. Katherine Kohle  
Practicing physician



CMA Driver's Guide  
9<sup>th</sup> edition





# **CMA Fitness to Drive - Dementia**

- *Cognitive screening alone cannot be used to determine fitness to drive*
- *If a patient's fitness to drive is unclear, the physician should recommend an on-road assessment*

# **3<sup>rd</sup> Canadian Consensus Conference on Dementia – Mild to Moderate**

- **Clinicians should counsel that giving up driving inevitable – strategies to ease this transition should occur early in clinical course (Grade B, Level 2)**
- **Driving is contraindicated in persons unable for cognitive reasons to perform multiple IADLS or any BADLS (Grade B, Level 3)**
- **Driving ability in earlier stages of dementia should be tested on an individual basis (Grade B, Level 3)**

**Hogan et al. Alzheimer's & Dementia 2007;3:355-38**

**[www.cccdtd.ca](http://www.cccdtd.ca)**

# **3<sup>rd</sup> Canadian Consensus Conference on Dementia – Mild to Moderate**

- **No single brief cognitive test (e.g. MMSE) or combination of tests has sufficient sensitivity or specificity to be used as sole determinant of driving ability. Abnormalities on tests such as MMSE, clock drawing and Trails B should result in further in-depth testing (Grade B, Level 3)**
- **A health professional-based comprehensive off- and on-road driving evaluation is the fairest method of individual testing (Grade B, Level 3)**
- **For those deemed safe to drive, reassessment of driving ability should take place every 6-12 months or sooner if indicated (Grade B, Level 3)**

# **Driving and Dementia**

## **Updated International Guideline**

### ***An International Approach to Enhancing a National Guideline on Driving and Dementia***

**Mark J. Rapoport, Justin N. Chee, David B. Carr, Frank Molnar, Gary Naglie, Jamie Dow, Richard Marottoli, Sara Mitchell, Mark Tant, Nathan Herrmann, Krista L. Lanctôt, John-Paul Taylor, Paul C. Donaghy, Sherrilene Classen & Desmond O'Neill**

**Current Psychiatry Reports 2018;20:16**

# International Guideline

- 1. Dementia often has a direct effect upon fitness to drive, and clinicians should address cognitive compromises that may impact fitness to drive (Class C , 96.6% Agreement)**
- 2. Diagnosis of dementia alone is not sufficient to withdraw driving privileges (Class A, 93.8% Agreement)**
- 3. Severe dementia is an absolute contraindication to driving (Class C, 96.6% Agreement)**
- 4. It is unlikely that safe driving can be maintained in the presence of moderate dementia (e.g. the additional presence of basic ADL impairments) and is to be strongly discouraged. If the patient desires to drive, they should be formally assessed and monitored very carefully (Class B, 92.4% Agreement)**

# International Guideline

**5a. People with dementia with progressive loss of two or more IADLs due to cognition (but no basic ADL loss) are at higher risk of driving impairment (Class A, 95.2% Agreement)**

**5b. A formal assessment and ongoing monitoring of fitness to drive is recommended in this situation if the patient wishes to continue driving (Class B, 93.8% Agreement)**

**6a. No in-office test or battery of tests including global cognitive screens (e.g. MMSE, MOCA) have sufficient sensitivity or specificity to be used as a sole determinant of driving ability in all cases (Class A, 97.2% Agreement)**

**6b. However, abnormalities on these tests may indicate a driver at risk who is in need of further assessment (Class B, 95.9% Agreement)**

# **American Academy of Neurology**

- **An MMSE score < 25 is possibly useful in identifying patients at increased risk for unsafe driving, but the correlation between MMSE scores and driving performance is unclear and data are conflicting (Level C)**

**Iverson et al. Neurology 2010;74:1316-1324**

# American Academy of Neurology (cont'd)

- Reduced driving mileage or self-reported situational avoidance is possibly associated with increased risk of poor driving performance (Level C)
- A patient's self-rating of safe driving ability (Level A) and lack of situational avoidance (Level C) is not useful for determining that the patient is a safe driver
- *A caregiver's rating of a patient's driving ability as marginal or unsafe is probably useful in identifying unsafe drivers, but caregiver's ratings correlate only modestly with ORDT (Level B)*



# **American Academy of Neurology (cont'd)**

- **A history of a crash in the previous 1-5 years or a traffic citation in the previous 2-3 years is possibly useful in identifying patients with decreased driving ability (Level C)**
- **Aggressive or impulsive personality characteristics are possibly useful to identify patients with increased driving risk (Level C)**

# **Physician Conundrum: Best Interest of Patient vs. Public**



# What Does Driving Mean to Older Adults?

- Convenience
- Independence
- Autonomy
- Competence
- Freedom
- Personhood



# Health Outcomes of Driving Cessation

- **Poorer general health (3/4 studies)**
- **More depressive symptoms (5/6 studies)**
  - OR 1.91; 95% CI = 1.61-2.27
- **Greater cognitive decline (2/2 studies)**
- **Greater risk of mortality (2/2 studies)**
  - 4-6x; 68% higher
- **Greater LTC placement - NH, assisted living or RH (1/1 study)**
  - HR 4.85; 95% CI = 3.26-7.21

# Health Outcomes of Driving Cessation

- **Poorer functional status (5/5 studies)**
- **Greater dependency and loss of control (2/2 studies)**
- **Less social engagement (5/6 studies)**
  - 51% reduction in size of social network
- **Lower out of home activity level (1/1 study)**

Chihuri et al. JAGS 2016;64:332-341

# Legal Reporting Requirements

Province	Legislation
Alberta	N/A, interpreted as discretionary
British Columbia	Mandatory if warned and still drives
Manitoba	Mandatory
New Brunswick	Mandatory
Newfoundland/Labrador	Mandatory
North West Territories	Mandatory
Nova Scotia	Discretionary
Nunavut	Mandatory
Ontario	Mandatory/Discretionary
PEI	Mandatory
Quebec	Discretionary
Saskatchewan	Mandatory
Yukon	Mandatory

# Legal Obligations Ontario

- **As of July 1, 2018, Physicians and NPs have mandatory reporting obligation only for specific medical conditions, functional and visual impairments**
- **Option for discretionary reporting of other medical conditions, functional and visual impairments**
- **A physician is NOT required to report a person whose impairment is, in the physician's opinion:**
  - **of a distinctly transient or non-recurrent nature, or**
  - **modest or incremental changes in ability that are attributable to a process of natural aging, unless the cumulative effect of the changes constitutes a condition or impairment listed above**

**Ontario Highway Traffic Act, Section 203.1, and Ontario Regulation 340/94**



Ministry of Transportation

## Medical Condition Report

Fee Schedule Code  
K035

Report by a prescribed person in compliance with Subsection 203(1) or 203(2) of the *Highway Traffic Act*.  
Please complete in full.

**Mail or fax to:** Medical Review Section, 77 Wellesley Street West, Box 589, Toronto ON M7A 1N3  
Fax Number: 416-235-3400 or 1-800-304-7889 Telephone Number: 416-235-1773 or 1-800-268-1481

Fields marked with an asterisk (\*) are mandatory. When a report of a mandatory condition is made it will result in a licence suspension.

### Part 1. Patient Information

Last Name *		First Name *		Middle Init.	Date of Birth (yyyy/mm/dd) *
<b>Current Address</b>					
Unit Number	Street Number *	Street Name or Lot *		PO Box	Province *
City/Town/Village *		Postal Code	<input type="checkbox"/> Male * <input type="checkbox"/> Female *	Driver's Licence Number (if available):	

### Part 2. Medical Condition, Functional Impairment or Visual Impairment - Please check all diagnoses that apply.

#### 1. Cognitive Impairment

This patient has or appears to have a disorder resulting in cognitive impairment that affects attention, judgement and problem solving, planning and sequencing, memory, insight, reaction time or visuospatial perception, and results in substantial limitation of the person's ability to perform activities of daily living.

**Due to:**  Dementia  Brain Injury  Unknown  Other (Specify) \_\_\_\_\_



# **New Ontario Legislation**

## **Mandatory Reporting**

- **Cognitive impairment that results in substantial limitation of the person's ability to perform activities of daily living**
- **Sudden incapacitation: a disorder that has a moderate or high risk of sudden incapacitation, or that has resulted in sudden incapacitation and that has a moderate or high risk of recurrence**

# **New Ontario Legislation (Cont'd)**

- **Motor or sensory impairment resulting in severe motor impairment that affects coordination, muscle strength and control, flexibility, motor planning, touch or positional sense**
- **Visual impairment**
- **Uncontrolled substance use disorder and the person is non-compliant with treatment recommendations**

# **New Ontario Legislation (Cont'd)**

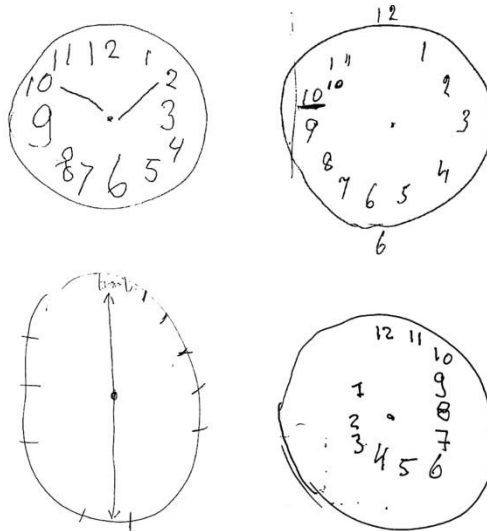
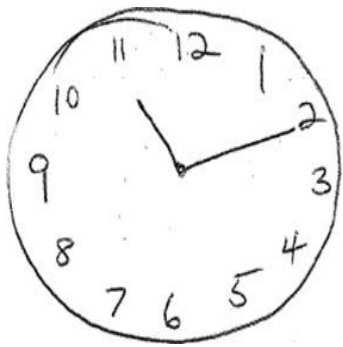
- **Psychiatric illness that involves acute psychosis or severe abnormalities of perception or the person has a suicidal plan involving a vehicle or an intent to use a vehicle to harm others**

# **CURRENT 80 & OVER LICENCE RENEWAL PROGRAM**

- **Based on an extensive operational review of Ontario's senior licensing program, the Ministry made the following changes in 2014:**
    - **Eliminated the knowledge test**
    - **Vision assessment: Ensure minimum vision requirement is met at 20/50**
    - **Introduced two brief screening tools to objectively and more effectively identify drivers who may need to take a road test or see their physician**
    - **Shortened and improved the educational session**
- New renewal program can be completed in less than 90 minutes**

# COGNITIVE SCREENING TOOLS

## 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

# Approach to Assessment of Fitness to Drive



# **AAN Questionnaires**

- **The questionnaires addresses historical features with Level A, Level B, or Level C evidence of relevance to driving competency, as well as selected items from the Manchester Driver Behaviour Questionnaire**
- **It is only intended to be used in the qualitative determination of driving risk in elderly patients and patients with dementia**
- **It has not been validated for use in the quantitative determination of driving risk**

**CDR 0.5-1.0**



**Evaluate for risk factors**

**Caregiver report of marginal or unsafe skills**

**Level B  
evidence**

**History of citations**

**History of crashes**

**Level C  
evidence**

**Driving <60 miles (~100 km)/ week**

**Situational avoidance**

**Aggression, impulsivity**

**MMSE  $\leq$  24**

**Other**

**Alcohol, medications, sleep disorders, visual impairment, motor impairment**



# **Patient Questionnaire**

- 1. How many times have you been stopped or ticketed for a traffic violation in the last three years?**
- 2. How many accidents have you been in, caused, within the last three years?**
- 3. In how many accidents were you at fault in the last three years?**

# **Patient Questionnaire (cont'd)**

- 4. I have concerns about my ability to drive safely.**
- 5. Others have concerns about my ability to drive safely.**
- 6. I have limited the amount of driving that I do.**
- 7. I avoid driving at night.**
- 8. I avoid driving in the rain.**
- 9. I avoid driving in busy traffic.**

# **Patient Questionnaire (cont'd)**

- 10. I will drive faster than the speed limit if I think that I won't be caught.**
  - 11. I will run a red light if I think that I won't be caught.**
  - 12. I will drive after drinking more alcohol than I should.**
  - 13. When I get angry with other drivers, I will honk my horn, gesture, or drive up too closely to them.**
- How many miles/km a week do you drive?**

**CDR 0.5-1.0**

**CDR 2.0**

**Risk factors**

**None**

**Few**

**Several**

**Multiple**

**CDR 0.5**

**CDR 1.0**

**CDR 0.5**

**CDR 1.0**

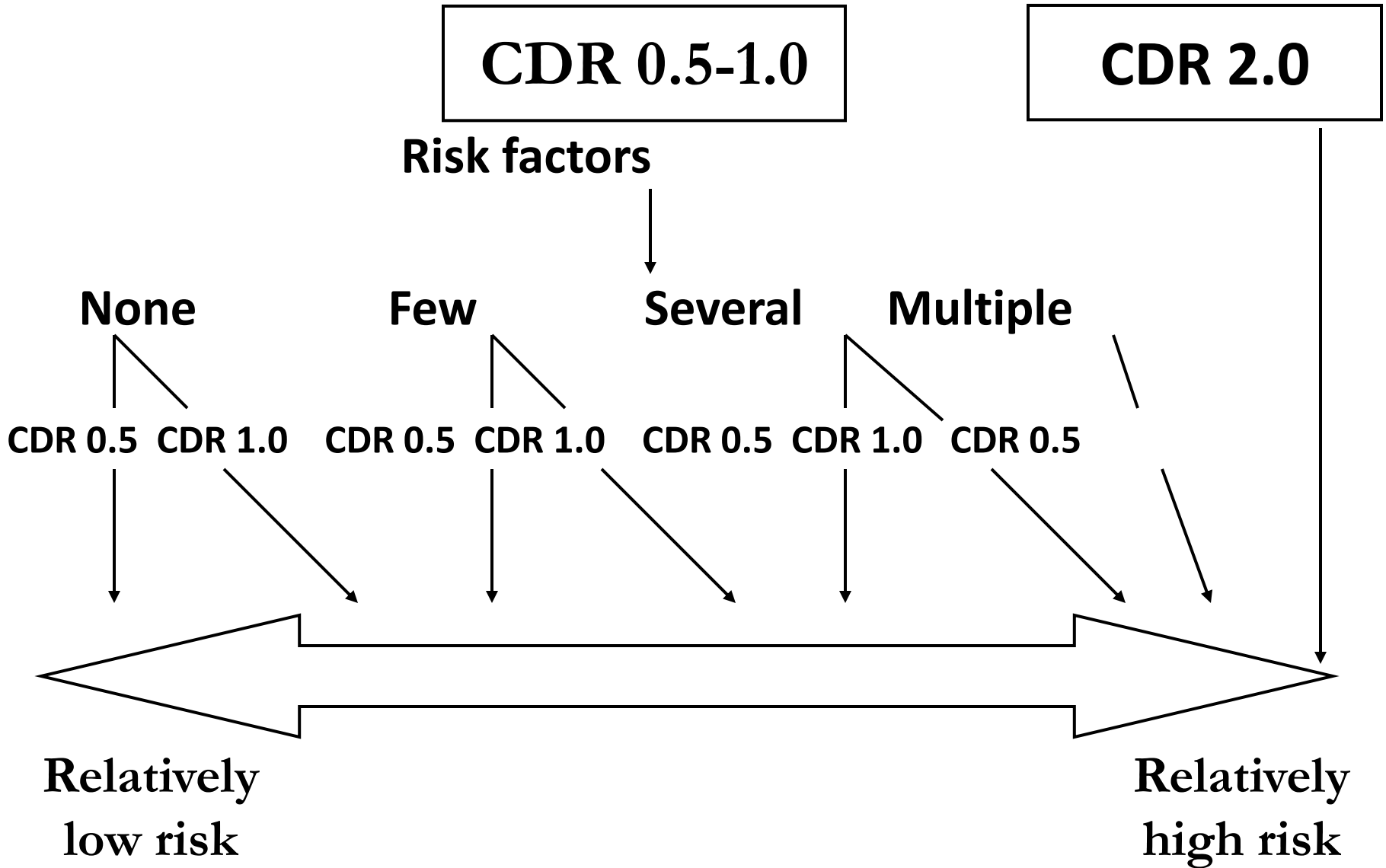
**CDR 0.5**

**CDR 1.0**

**CDR 0.5**

**Relatively  
low risk**

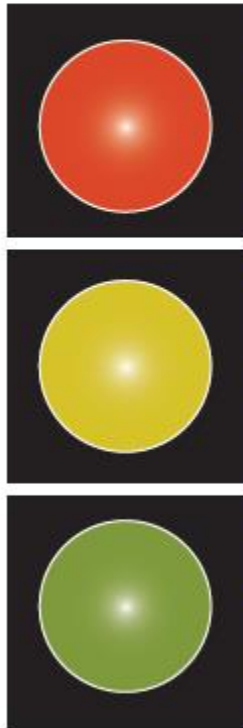
**Relatively  
high risk**



# THE DRIVING AND DEMENTIA TOOLKIT

(3RD EDITION)

(FOR HEALTH PROFESSIONALS)



The Champlain  
Dementia Network

Réseau de la démence  
de la région Champlain



Regional Geriatric Program  
of Eastern Ontario

Programme gériatrique régional  
de l'Est de l'Ontario

2009

[www.rgpeo.com](http://www.rgpeo.com)

# **Driving and Dementia Toolkit**

## **3<sup>rd</sup> Ed.**

- 1. Family concerns about person's driving**
  - Red flags**

# Red Flags

- Collisions and/or new damage/dents to the car
- Getting lost
- Needing a co-pilot
- Near-misses with vehicles/pedestrians
- Increased traffic tickets or warnings
- Confusing the gas and brake
- Missing stop signs/red lights/exits; stopping at green lights
- Inappropriate driving speeds (too fast/slow)
- Not observing during lane changes/merging
- Others honking/irritated with the driver
- Friends or relatives reluctant to drive with the older driver - *the 'child safety question'*

# **Driving and Dementia Toolkit**

## **3<sup>rd</sup> Ed.**

- 2. Drugs that can cause drowsiness, inattention and slow reaction time**
- 3. Visual acuity and fields**
- 4. Physical problems that can interfere with driving a car**
- 5. Cognitive impact on BADL and IADL**
- 6. Dementia type**



# **Dementia Type and Driving - FTD**

- **15 patients with FTD and 15 age, sex and education-matched healthy controls**
- **Performance on driving simulator**
- **FTD patients exceeded speed limits, ran stop signs and were involved in more crashes than controls**
- **Agitated behaviour/disinhibition was strongly correlated with crashes ( $r = 0.60$ ,  $p < .05$ )**

De Simone et al. Dement Geriatr Cogn Disord 2007;23:1-7

# **Dementia Type and Driving - DLB**

- **Prominent attention and visuoperceptual deficits, occurrence of visual hallucinations and fluctuating levels of alertness may impact driving ability**

**Carr and Ott. JAMA 2010;303:1632-1641**

# **Dementia Type and Driving - DLB**

- **15 drivers > 65 with DLB vs. 21 healthy controls**
- **Performance on driving simulator**
- **DLB drivers made significantly more driving errors and were assigned 4 x's the number of demerit points**
- **DLB drivers exceeded the speed limit significantly more often, crossed the centre line more frequently, exceeded the road edge more often, failed to stop at stop lights significantly more often, and had significantly more crashes**

Yamin, S. et al. Int'l J Alzheimer's Disease 2015

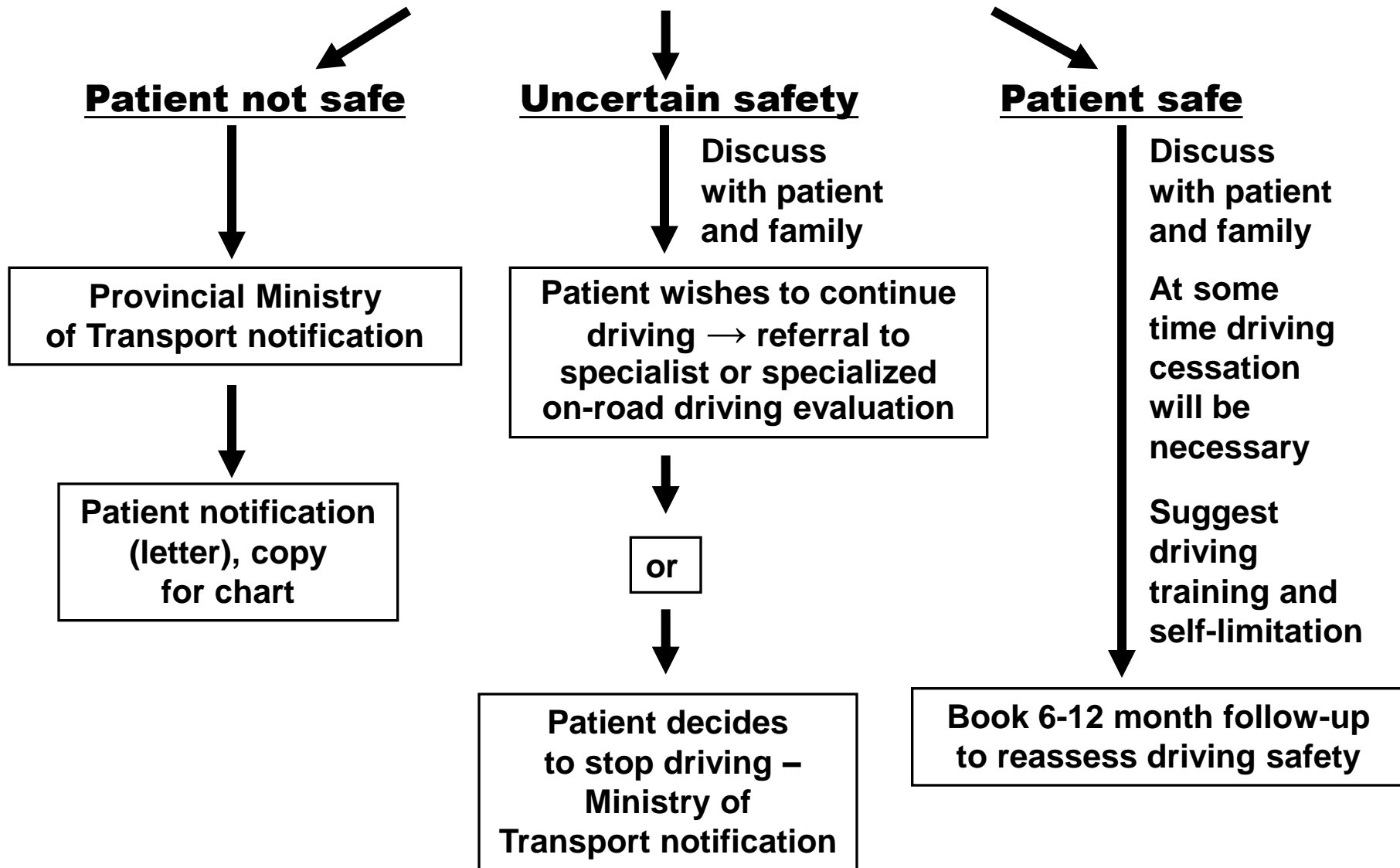
# **Driving and Dementia Toolkit**

- 7. Judgment and insight**
- 8. Visuospatial skills (pentagons and clock drawing)**
- 9. Trail-Making Test, Parts A (unsafe: > 2 min. or 2+ errors) and B (unsafe: > 3 min. or 3+ errors; unsure: 2-3 min. or 2 errors)**

# **Driving and Dementia Toolkit**

**10. Reaction time (12" ruler drop test; caught by max. 9" between thumb and index finger)**

# Dementia Driving Assessment





# Clinician's Guide to Assessing and Counseling Older Drivers



3rd Edition



# **Clinical Assessment of Driving Related Skills (CADReS)**

- **Screen for “red flags”:**
  - **Medical conditions or medications that may adversely affect driving**
  - **Hx of recent adverse driving events or behaviours (family history of concerns)**
  - **Hx of functional or mobility impairment**
- **CADReS in those at increased driving risk**



# CADReS

- **Vision Assessment**
  - **Visual acuity**
  - **Visual fields**
  - **+/- Contrast sensitivity (e.g. Pelli-Robson contrast sensitivity chart)**

# CADReS

- **Cognitive Assessment**
  - MoCA
  - Trails B (+/- Trails A)
  - Clock Drawing
  - Snellgrove Maze test

# CADReS

- **Motor and Somatosensory Testing**
  - **Rapid Pace Walk Test/Get Up and Go**
  - **Range of Motion (neck, shoulder, elbow, ankle and fingers)**
  - **Proprioception**

# Rapid Pace Walk

- **Time to walk 10 feet and back (20 feet)**
- **Measure of lower limb strength, endurance, range of motion, balance and gross proprioception**
- **> 9 seconds associated with increased risk of at-fault crash**

# **Get Up and Go**

- **Have person rise from a straight backed chair, walk 10 ft (3.05 m), turn, walk back to the chair and sit down**
- **Not timed**
- **Scored as “deviation from confident, normal performance”**
- **Anything more than “slightly abnormal” considered increased risk**

# CADReS

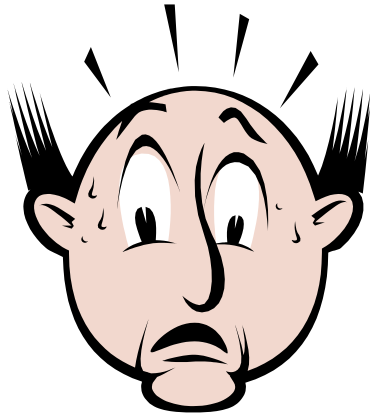
- **Identify potentially remediable factors that are posing driving risk and intervene (e.g., poorly treated medical conditions, pain, polypharmacy or high risk medications)**
- **Refer for driving assessment if identify areas of concern that suggest possible driving safety concerns**
- **Counsel to stop driving and report if risk of continued driving is prohibitive**

# Self-Screening Tools

- Self-Screening Tools
  - CAA Roadwise Review
    - <https://www.aaafoundation.org/roadwise-review-online>
  - Drivers 55 Plus: Check your own performance
    - <http://www.aaafoundation.org/pdf/driver55.pdf>
  - The Older and Wiser Driver
    - <http://www.aaafoundation.org/pdf/older&wiser.pdf>
  - How to Help an Older Driver
    - <http://www.aaafoundation.org/pdf/ODlarge.pdf>
  - Fitness to drive screening measure for caregivers
    - <http://ftds.php.ufl.edu/>

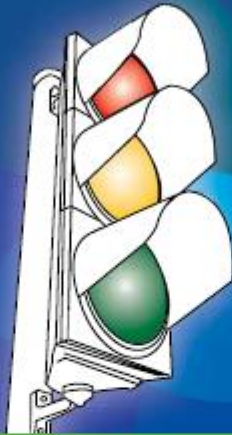


# Breaking the News





# The Driving and Dementia Toolkit



**For Patients and Caregivers**

**1<sup>st</sup> Edition**

**Byszewski et al. BMC  
Geriatrics 2013;13:117**



Champlain Dementia Network  
Réseau de la démence de la région Champlain



Regional Geriatric Program  
of Eastern Ontario

# **Breaking the News**

- **Ask that a family member be present for support**
- **Be empathic, but firm and non-negotiable in your final recommendation regarding driving**
- **Explain why patient's driving safety is at risk**
- **Explain your concern for patient's safety and the safety of others**
- **Explain that 'clean' driving record is a great accomplishment, but does not change risk**

# **Breaking the News (Cont'd)**

- **Indicate that part of being a responsible driver is retiring from driving before they are forced to stop because of a serious at-fault crash that could be fatal for patient, family members or others**
- **Explain that since patient now aware of driving risk, they carry a responsibility regarding their actions**

# Breaking the News (Cont'd)

- Explain legal obligation to report to driving authorities and the process
- Indicate that a summary of the discussion will be noted in the chart and inform that insurance company will not cover crash-related costs
- Provide a written letter/ script summarizing the driving recommendation
- *Acknowledge that it is normal to be unhappy or even angry about this recommendation*

# Tips for Family

- **Keep letter from driving authority/MD in prominent location and refer to it to remind patient they can't drive**
- **Remove car, when possible (give to family/friend, donate, sell, tow to 'junk yard')**
- **Hide keys**
- **Purchase new car alarm to inform of attempts to drive**
- **Disable car (e.g. remove battery)**

# Transportation Plan

- **Identify all activities patient used to drive to (e.g. shopping, banking, leisure activities)**
- **Discuss Transportation Alternatives**
  - **Walking**
  - **Public Transportation (service for disabled)**
  - **Taxi Accounts/Uber/Lyft (cheaper than maintaining car if drive less than ~6000 km/yr)**
  - **Friends & Family**
  - **Community Services (shuttles, volunteer drivers)**
- **Social work referral (emotional, social and financial issues)**



# Transportation Cost Worksheet

Owning and operating a vehicle can be more expensive than you think! By writing down your actual expenses, you can get an idea of how much money could be available for alternative transportation if you were to stop driving.

To determine the annual expense to own and operate a car, list all the related expenses below. Don't forget to multiply by 12 for monthly expenses, or by 52 for weekly expenses. For less frequent expenses, such as tires, estimate the cost and divide by the number of years between expenses. Once you have the annual expense for owning and operating the vehicle, you can get a better idea of how much you are already spending on transportation.

VEHICLE COST PER YEAR	ANNUAL COST
<b>Car/Lease Payment</b>	
<b>Regular Operating Expenses</b>	
• Gas .....	
• Washer Fluid .....	
• Parking .....	
• Tolls .....	
• Other .....	
<b>Regular Maintenance</b>	
• Oil Changes .....	
• Minor Tune-ups .....	
• Wiper Blades .....	
• Lights .....	
• Car Wash/Wax .....	
• Other .....	
<b>Long-Term Maintenance</b> <i>(estimate the cost and divide by the number of years between expenses)</i>	
• Tires .....	
• Brakes .....	
• Major Tune-ups .....	
• Repair/Replace Parts .....	
• Other .....	
<b>Insurance – Annual Cost</b>	
<b>Motor Club/Roadside Assistance</b>	
<b>Registration/License Plate Fees</b>	
<b>License Fees</b>	
<b>Vehicle Inspection/Emissions Fees</b>	
<b>Total Cost Per Year</b>	<b>\$</b>

Source  
At the Crossroads: Family Conversations about Alzheimer's Disease, Dementia and Driving (2013, The Hartford Centre, United States)

# Adjusting & Adapting to Change Resources

## 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

Source  
How to Understand  
and Influence Older  
Drivers  
(2013, US Department  
of Transportation and  
National Highway  
Traffic Safety  
Administration, United  
States)



# Mobility & Community Access Resources

Examples of how to get around without a car:

(It helps to obtain names of services and phone numbers)

- Enlist help of family
- Enlist help of friends
- Public transit
- Para Transpo
- Volunteer drivers
- Taxi company vouchers
- Shuttle service (call the local community centre)
- Explore local services that deliver groceries, books, prescriptions (including on-line ordering) and newspapers

**The Driving & Dementia Toolkit for  
Patients and Caregivers  
(2011, Regional Geriatric Program of  
Eastern Ontario, Canada)**

# **Transportation Plan**


- **Discuss whether alternative resources will meet patient needs**
- **Address any barriers to use of alternative transportation resources**
  - **i.e. financial constraints, limited service/destinations, reluctance to depend on family/friends**

# **CIHR CCNA – Driving and Dementia**

- **5-year study to develop and evaluate an intervention targeted at people with mild dementia and their caregivers to facilitate driving cessation and improve outcomes post-cessation**
- **We have developed the Driving Cessation in Dementia Intervention Framework and Toolkit (DCD-FT) – creating web application and undergoing implementation evaluation with AS chapters**

## REVIEW ARTICLE

# A systematic review of intervention approaches for driving cessation in older adults

Mark J. Rapoport<sup>1,4</sup> , Duncan H. Cameron<sup>1,2</sup>, Sarah Sanford<sup>2</sup>, Gary Naglie<sup>2,3,5,6</sup> on behalf of the Canadian Consortium on Neurodegeneration in Aging Driving and Dementia Team

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<sup>6</sup>Research Department, Toronto Rehabilitation Institute, University Health Network, Toronto, Ontario, Canada

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Int J Geriatr Psychiatry 2017

**Objective:** The aim of this project was to review the literature on interventions aimed at facilitating driving

# Interventions for Driving Cessation

- **Only 3 controlled studies have assessed interventions for driving cessation**
  - One for dementia sufferers post-cessation of driving
  - One only for family members of dementia sufferers pre-cessation
  - One only for people without dementia pre or post driving cessation
- **Very small sample sizes, very short time horizons, limited assessment of impact of interventions on major outcomes**

Dobbs et al. Topics in Geri Rehab 2009;25:73-86

Stern et al. Gerontol & Geriatrics Education 2008;29:363-382

Liddle et al. The Gerontologist 2014; 54:409-422

# Caregiver Intervention

- Intervention for caregivers of current drivers with dementia
- Active intervention (n = 31) vs. written materials only (n = 23) vs. waitlist control (n = 12)
- **4 sessions x 2 hours led by research associate** - Orientation to dementia and driving cessation; Toolkit for transition (At the Crossroads, The Hartford, 2007); Video case study; Last resort techniques and next steps
- Intervention group more likely to have spoken with their loved ones about driving retirement (90% vs. 52% vs. 58%)
- Intervention group more likely to use the “Agreement with My Family About Driving” (23% vs. 10% vs. 0%)
- Intervention group felt significantly more prepared to address driving cessation with their loved one and were less concerned that their loved ones would be hurt or angry by discussing the topic of driving cessation vs. other 2 groups

Stern et al. Gerontology & Geriatrics Education 2008; 29:363-382

# Driving Cessation Support Groups

- 28 people with dementia who lost driving privileges vs. 19 controls attending Alzheimer Society support group
- **16 weekly sessions x 90 minutes led by clinical psychologist** who used problem- and emotion-focused coping strategies
- Pre-post GDS scores decreased significantly more for intervention vs. controls (effect size -0.87,  $p < 0.03$ )
- Intervention associated with improved QOL, reduced behaviour problems, and more positive emotional responses to license revocation over time, but **NOT** statistically significant

# Intervention for Non-demented

- University of Queensland Driver Retirement Initiative (UQDRIVE); a psycho-educational intervention to ease the process of transition to non-driving by enhancing mobility and community engagement (group outings such as using public transit)
- 67 intervention vs. 64 waitlist control older drivers without dementia or recently stopped driving
- **6 sessions x 3-4 hours led by health professional and peer leader** - 7 modules: Growing Older, Driving Later in Life, Adjusting to Losses and Changes, Experiences of Retiring, Alternative Transport, Lifestyle Planning, Advocacy and Support
- Intervention group had significantly more excursions outside of the home than controls from pre- to post-treatment (ES 0.46,  $p=.01$ ), but not at 3 months F/U
- Intervention group more confident in staying involved in the community and remaining involved with activities important to them (ES .038,  $p=.001$ ), and demonstrated an increase in walking and use of public transportation (ES .23,  $p=.025$ ), but not at 3 months F/U

Liddle et al. The Gerontologist 2014; 54:409-422



# **Driving and Dementia: Conclusions**

- **Increasing numbers of older drivers who have a high prevalence of dementia, which increases their crash risk**
- **Driving assessment guidelines are primarily opinion-based rather than evidence based**
- **In the absence of a validated assessment tool for assessing fitness to drive, several approaches to identify high risk drivers have been proposed**
- **For those who have to stop driving, it is critical to create a transportation plan and support their emotional response**

**THE END**

The image features the words "THE END" in a bold, 3D, purple font. The letters are rendered with a slight perspective, making them appear to sit on a grey floor. From the base of each letter, a white line extends downwards and outwards, creating a sense of depth and perspective. The background is a light grey gradient.

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