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CCNA Canadian Consortium on Neurodegeneration in Aging
CCNV Consortium canadien en neurodégénérescence associée au vieillissement

Approaching Driving Cessation in Older Adults with Dementia

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Sunnybrook HEALTH SCIENCES CENTRE

UNIVERSITY OF TORONTO

Conflicts of Interest

- Canadian Institutes of Health Research (CIHR)
- Canadian Consortium on Neurodegeneration in Aging (CCNA)
- Ontario Ministry of Health AFP Innovation Fund
- Centre for Aging and Brain Health Innovation (CABHI)
- Ministry of Transportation of Ontario
- Transport Canada

Learning Objectives

At the end of this webinar, participants should be able to:

1. **Describe dementia-related driving risks.**
2. **Identify approaches to assessing fitness to drive in persons with dementia.**
3. **Implement strategies for facilitating the process of driving cessation.**

People with Dementia Driving

- **Canadian Outcome Study in Dementia – mild-moderate dementia**
- **28% driving at baseline**

Time Period	% Still Driving
2 Years	~50%
3 Years	~25%

Herrmann et al., CMAJ 2006

Driving Performance in AD

- Systematic review of driving competence in people with AD (very mild and mild AD) compared with controls
- 23 studies using on-road driving tests; 9 simulator studies
- 15-65% failed on-road driving assessment
- More problems with road rules, lane maintenance, lane changing, turning, maintaining road speed, stopping appropriately and avoiding collisions
- Less attention and slower decision-making
- Driving performance decreased with increasing dementia severity

Jacobs et al., J Neurol 2017

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%
Fail	*2%*	*13%*	*32%*

Duchek et al., JAGS 2003; Ott et al., Neurology 2008

Crash Risk in Dementia

- Caregiver-reported and/or state reported MVCs
  - 6/10 studies found that drivers with dementia crashed more often than controls (~2x to 10x)

Man-Son-Hing et al., JAGS 2007
Chee et al., Am J Geriatr Psychiatry 2017

Health Outcomes of Driving Cessation

- Poorer general health
- More depressive symptoms
- Greater cognitive decline
- Greater risk of mortality
- Greater LTC placement - NH, assisted living or RH

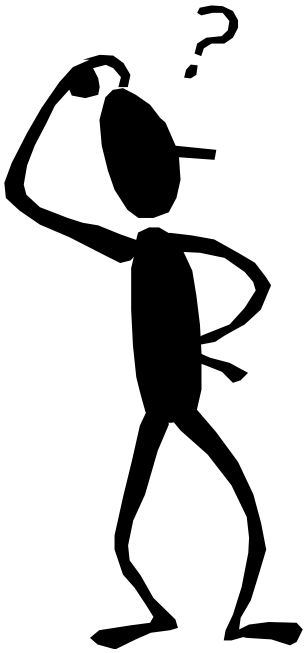
Chihuri et al., JAGS 2016

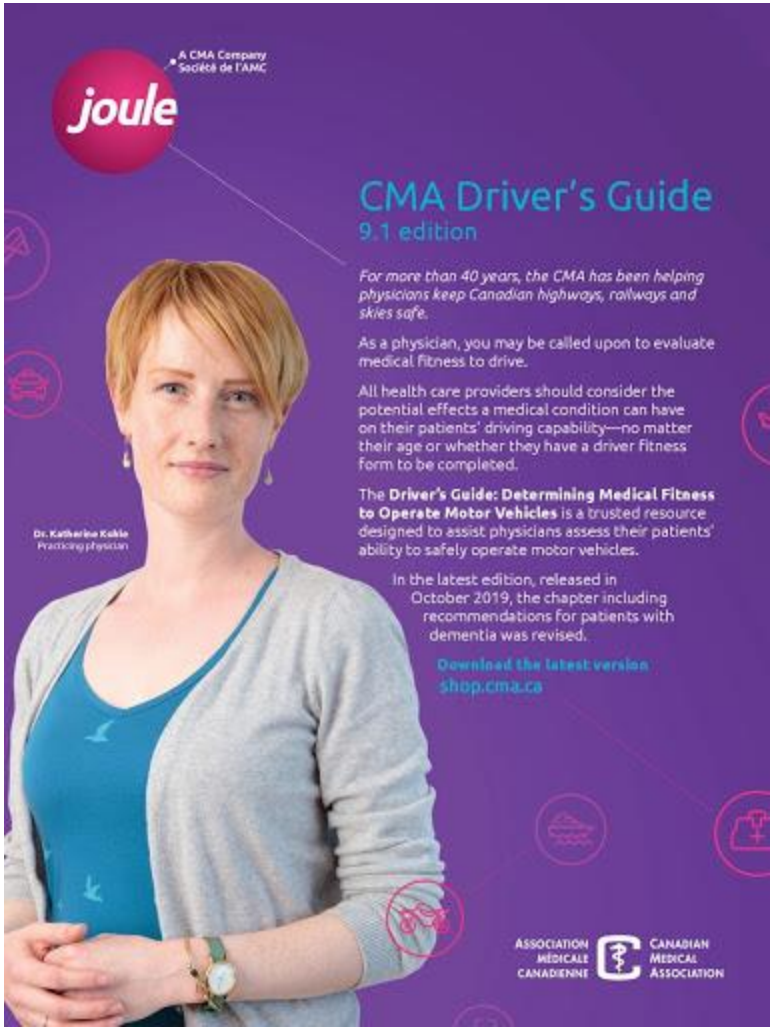
Health Outcomes of Driving Cessation

- Poorer functional status
- Greater dependency and loss of control
- Less social engagement
- Lower out of home activity level

Chihuri et al., JAGS 2016

Clinician Conundrum:
Best Interest of Patient vs. Public





CMA Driver's Guide (Edition 9.1; CMA, 2019)

https://joulecma.ca/evidence/CMA-drivers-guide

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

CMA Fitness to Drive - Dementia

1. Cognitive screening alone cannot be used to determine fitness to drive, except when valid test scores are in the severely impaired range.
2. If a patient's fitness to drive is unclear, the physician should recommend further assessment.

CMA Driver's Guide (Edition 9.1; CMA, 2019)

https://joulecma.ca/evidence/CMA-drivers-guide

Int'l Consensus Recommendations on Fitness to Drive in Dementia

1. Dx of dementia alone is not sufficient to withdraw driving privileges (A)
2. Severe dementia is a contraindication to driving (C)
3. It is unlikely that safe driving can be maintained in moderate dementia (some basic ADL impairment) and it should be strongly discouraged; if the person with dementia (PWD) wants to keep driving, they should be formally assessed and very carefully monitored (B)

Rapoport et al., Current Psychiatry Reports 2018

Int'l Consensus Recommendations (Cont'd)

4. People with dementia with progressive loss of 2+ IADLs due to cognition (but no basic ADL impairment) are at higher risk of driving impairment (A); if the PWD wants to continue driving, a formal assessment and ongoing monitoring of driving fitness is recommended (B)
5. No in-office test or test battery (e.g., MMSE, MoCA) has sufficient sensitivity or specificity to be used as a sole determinant of driving ability (A); however, abnormalities on these tests may indicate a driver at risk who needs further assessment (B), or substantially impaired scores may preclude safe driving (C)
6. People with dementia who are deemed fit to continue driving should be re-assessed every 6-12 months or sooner, if indicated (B)

Rapoport et al., Current Psychiatry Reports 2018

Int'l Consensus Recommendations (Cont'd)

7. Any clinician who has concerns about whether a PWD's cognitive problems may adversely affect driving but is uncertain, should refer the patient for a functional driving assessment (C)
8. If there are clear aspects of the Hx, P/E and cognitive assessment that place the PWD and public at high risk, the PWD and caregiver should be advised not to drive, and this should be documented in the clinical record (C)
9. Clinicians should be aware of the legal driving reporting requirements in their jurisdiction (C)
10. Caregiver concerns about driving should be taken seriously (B); the possibility of COI must be considered if caregiver concern is absent (C)

Rapoport et al., Current Psychiatry Reports 2018

Int'l Consensus Recommendations (Cont'd)

11. A formal evaluation is recommended if behavioural disturbances may be interfering with safe driving (C)
12. Patients with prominent language impairment cannot be adequately screened with typical language-based tests and require a specialized assessment (e.g. SLP, neuropsychologist, formal driving assessment (C)
13. Conversation about eventual retirement from driving should be held as early as possible (C)
14. Driving cessation has been associated with social isolation, depression and other adverse health outcomes (C); it is important to monitor for these problems after a person with dementia has stopped driving (C)

Rapoport et al., Current Psychiatry Reports 2018

Approach to Assessment of Fitness to Drive

Cognitive Predictors of Driving Fitness

- Meta-analysis of 16 studies assessing predictive ability of cognitive tests and on-road FTD in people with dementia
- High heterogeneity
- Weak to moderate significant correlations with all domains except language; no cut off scores
  - General Cognitive Status, r=0.43
  - Attention/Concentration, r=0.39
  - Executive Function, r=0.31
  - Visuospatial skills, r=0.35
  - Memory, r=0.34

Rashid et al., Neuropsychological Rehabilitation 2020

Cognitive Predictors of Driving Fitness (cont'd)

- **Given the mere weak to moderate correlations found in most studies, FTD decisions should not only be based on cognitive testing**

Rashid et al., Neuropsychological Rehabilitation 2020

American Academy of Neurology

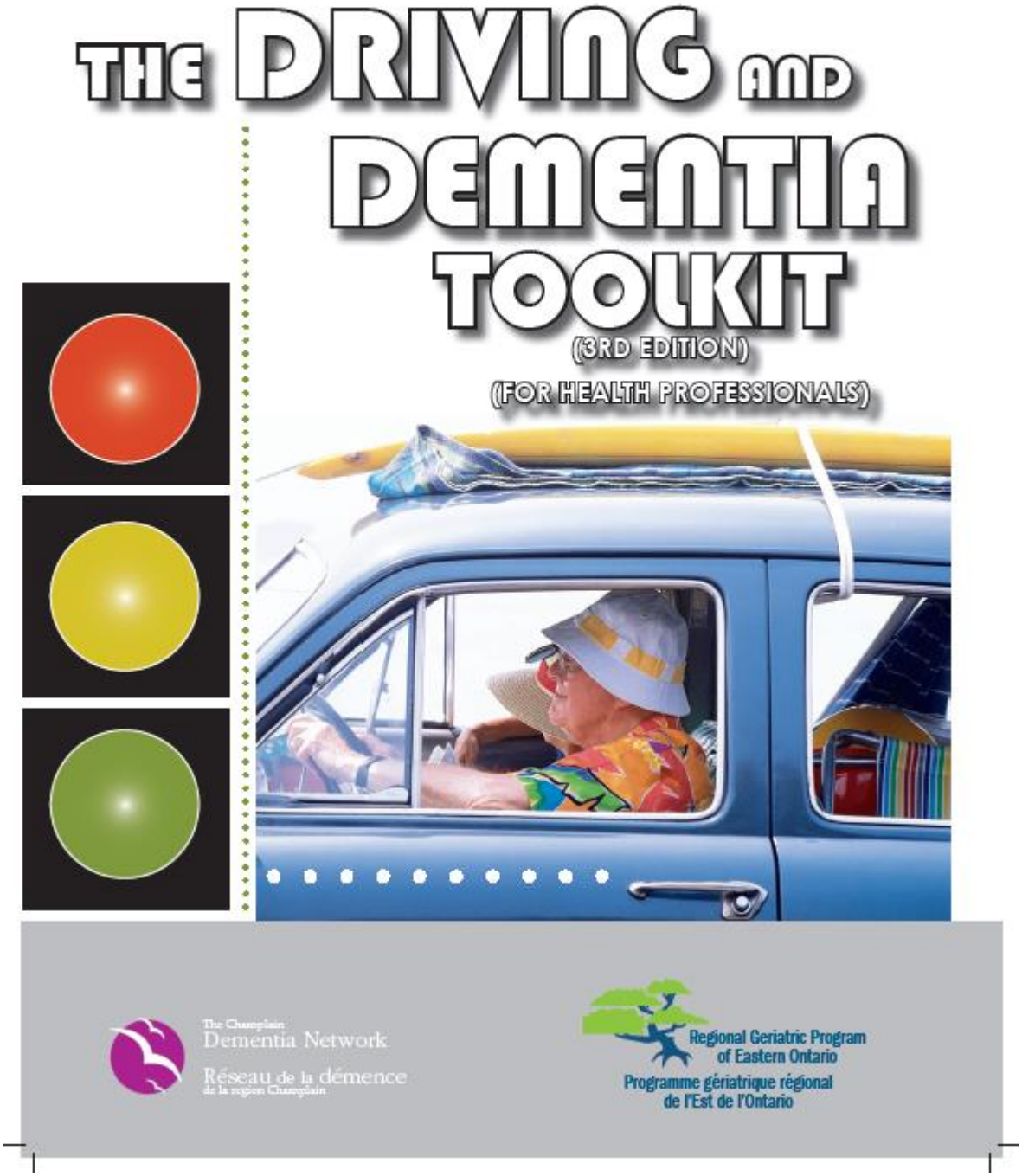
- **A driver's self-rating of safe driving ability is NOT useful for determining that they are a safe driver (Level A)**
- **A caregiver's rating of a person's driving ability as marginal or unsafe is PROBABLY useful in identifying unsafe drivers, but caregiver's ratings correlate only modestly with on-road driving tests (Level B)**

Iverson et al. Neurology 2010

American Academy of Neurology (cont'd)

- **POSSIBLY useful in identifying drivers at increased risk for unsafe driving (Level C)**
  - **Reduced driving mileage or self-reported situational avoidance**
  - **A history of a crash in the previous 1-5 years or a traffic citation in the previous 2-3 years**
  - **Aggressive or impulsive personality characteristics**

Iverson et al. Neurology 2010



(Regional Geriatric Program of Eastern Ontario, 2009)

www.rgpeo.com

Driving and Dementia Toolkit

1. **Dementia type**
   - **FTD (executive deficits, behaviour and/or judgment problems)**
   - **DLB (attention and VSP deficits, hallucinations and/or fluctuating level of alertness)**

Driving and Dementia Toolkit (Cont'd)

2. Cognitive impact on BADL and IADL
   - Unsafe: 2+ IADL or 1+ ADL

Driving and Dementia Toolkit (Cont'd)

3. Visuospatial skills
   - Intersecting pentagons and clock drawing
4. Trailmaking Test
   - Trailmaking A (unsafe: > 2 min. or 2+ errors)
   - Trailmaking B (unsafe: > 3 min. or 3+ errors)

Driving and Dementia Toolkit (Cont'd)

5. 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 (Cont'd)

6. Drugs that can cause drowsiness, inattention and slow reaction time
7. Visual acuity and fields
8. Physical problems that can interfere with operating a car

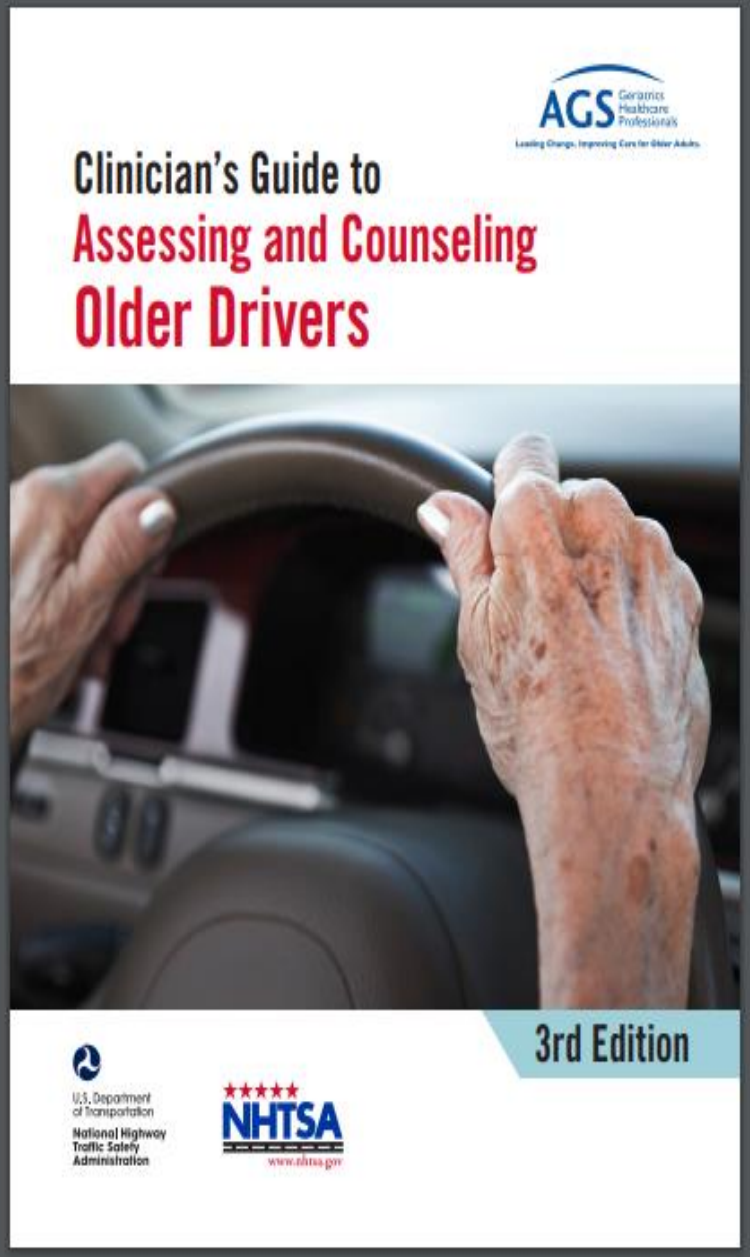
Driving and Dementia Toolkit (Cont'd)

9. Judgment/Insight
   - What would you do if driving and ball rolled onto street ahead of you?
   - Given your Dx of dementia do you think at some time you will need to stop driving?
10. Reaction Time
   - Ruler drop reaction time

Driving and Dementia Toolkit (Cont'd)

- Trichotomization based on assessment
  - Safe to drive
    - Counsel about driving cessation and F/U 6-12 months
  - Uncertain about safety to drive
    - Choice to stop driving or functional driving assessment
  - Unsafe to drive
    - Advise to stop driving, provide written note to PWD/family and report if required

www.nhtsa.gov/sites/nhtsa.dot.gov/files/812228_cliniciansguidetoolderdrivers.pdf



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 (Cont'd)

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

CADReS (Cont'd)

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

CADReS (Cont'd)

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

CADReS (Cont'd)

- Identify and address potentially remediable factors that are posing driving risk
- 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

Addressing the Challenge of Driving Cessation in PWD

CCNA Team 16: Driving and Dementia
Team Leaders: G. Naglie & M. Rapoport

Research Team

CCNA Canadian Consortium on Neurodegeneration in Aging
CCNV Consortium canadien en neurodégénérescence associée au vieillissement

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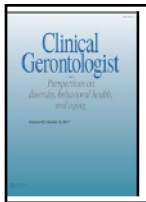
Synthesized the Literature
Systematic and Scoping Reviews



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Subjective Experiences of Driving Cessation and Dementia: A Meta-Synthesis of Qualitative Literature

Sarah Sanford PhD, Gary Naglie MD, Duncan H. Cameron MSc, Mark J. Rapoport MD & on behalf of the Canadian Consortium on Neurodegeneration in Aging Driving and Dementia Team

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OXFORD

Brief Report

Meta-analysis of Driving Cessation and Dementia: Does Sex Matter?

Nicolette Baines,[1] Bonnie Au,[2] Mark J. Rapoport,[1,3,4] Gary Naglie,[5,6] and Mary C. Tierney[1,2,7]

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REVIEW ARTICLE

International Journal of Geriatric Psychiatry

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

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

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International Psychogeriatrics

IPA

Article Metrics

First View

Interventions that support major life transitions in older adulthood: a systematic review

Brenda Vrkljan [a1], Ariane Montpetit [a2], Gary Naglie [a3], Mark Rapoport [a4] ...

https://doi-org.myaccess.library.utoronto.ca/10.1017/S1041610218000972 Published online: 11 July 2018

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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
Liddle et al. The Gerontologist 2014; 54:409-422
Stern et al. Gerontol & Geriatrics Education 2008;29:363-382

Solicited Key Stakeholder Input

- Qualitative study exploring key stakeholders' experiences and perspectives of driving cessation
  - 10 healthcare providers
  - 6 organizational reps
  - 13 family caregivers
  - 2 persons with dementia

Article

Dementia
0(0) 1–19

DOI: 10.1177/1471301218762838
journals.sagepub.com/home/dem
SAGE

Independence, loss, and social identity: Perspectives on driving cessation and dementia

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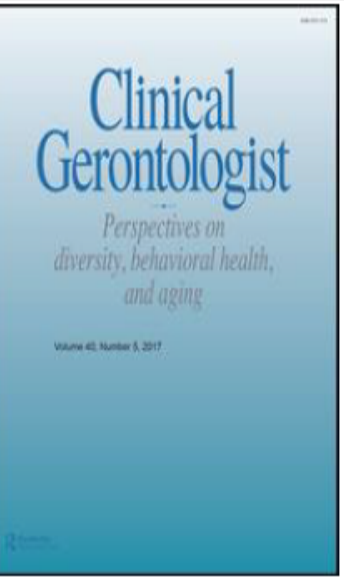
Perspectives on Driving Cessation

The main themes from stakeholders:

1. **Loss of independence and disruption to identity connected to emotional responses to driving cessation**
2. **Experience of driving cessation as one loss within a series of losses related to dementia**
3. **Importance of addressing emotional and identity-related effects in supportive responses to driving cessation**
4. **Support for maintained and adapted roles as a strategy to provide meaning and purpose in the context of driving cessation**

Sanford et al., Dementia 2019



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To cite this article: Sarah Sanford PhD, Gary Naglie MD, Duncan H. Cameron MSc, Mark J.

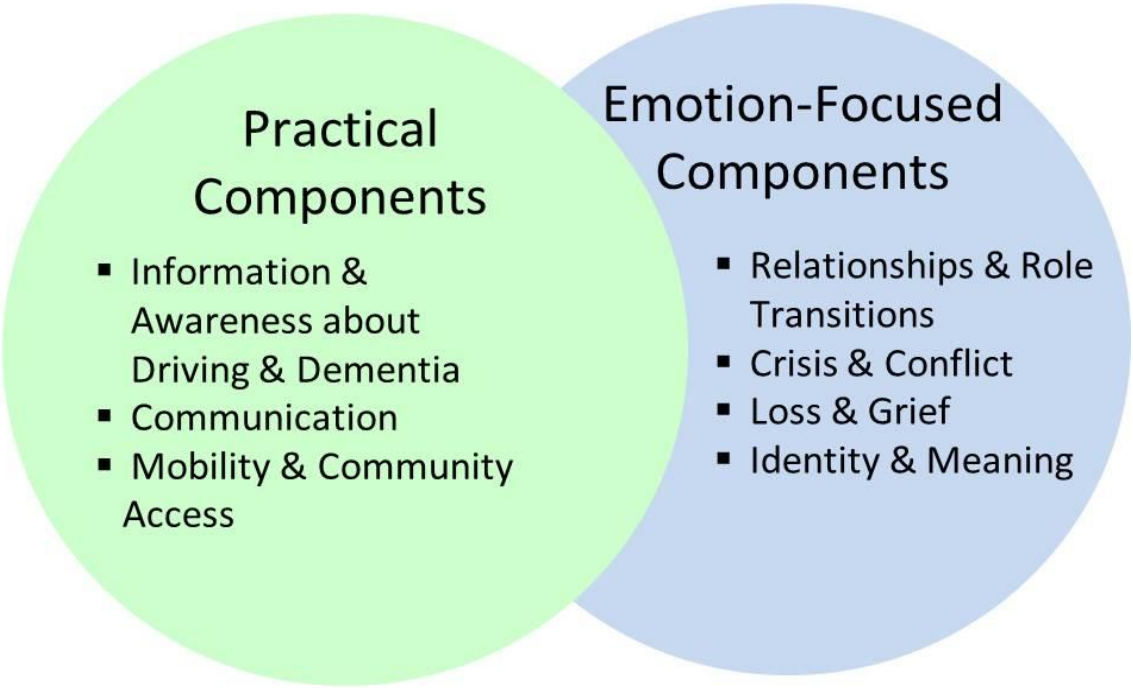
Subjective Experiences of Driving Cessation for People with Dementia: Meta-synthesis

Cross-cutting themes:

1. **Importance of open communication and autonomy in decision-making, and advanced planning to connect people with resources**
2. **Significance of relationships**
3. **Importance of providing support for the impact of cessation on identity and emotional wellbeing**
4. **Benefit of individualizing supportive approaches**

Sanford et al., Clinical Gerontologist 2020

Driving Cessation in Dementia Intervention Framework



Assembled Tools and Resources

- Identified and assessed publically available tools and resources that address driving cessation
  - Assessment based on evidence base, relevance and usability
- Curated the tools and resources to align with the intervention framework

DRIVING & DEMENTIA ROADMAP

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Search our site

I have dementia...

- and I am still driving.
- and I am no longer driving.

I am a family/friend carer who cares for...

- a person with dementia who is still driving.
- a person with dementia who is no longer driving.

I am a provider

- healthcare professional
- community service provider

Type here to search

ENG 10:00 AM 2020-10-07

Transportation Plan and Support

- Identify all activities patient used to drive to (e.g. shopping, banking, leisure activities)
- Discuss Transportation Alternatives
  - Walking
  - Friends & Family
  - Public Transportation/Disabled Transportation
  - Taxi/Uber/Lyft Accounts/Vouchers (cheaper than maintaining car if drive <~6000 km/yr); Private Drivers
  - Community Services/Volunteer Drivers
- Referral for support with emotional, identity and social issues

?

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