Driving & Dementia

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Initially presented as a partnership of the
Alzheimer Knowledge Exchange
and the Canadian Geriatrics Society

Conflict of Interest

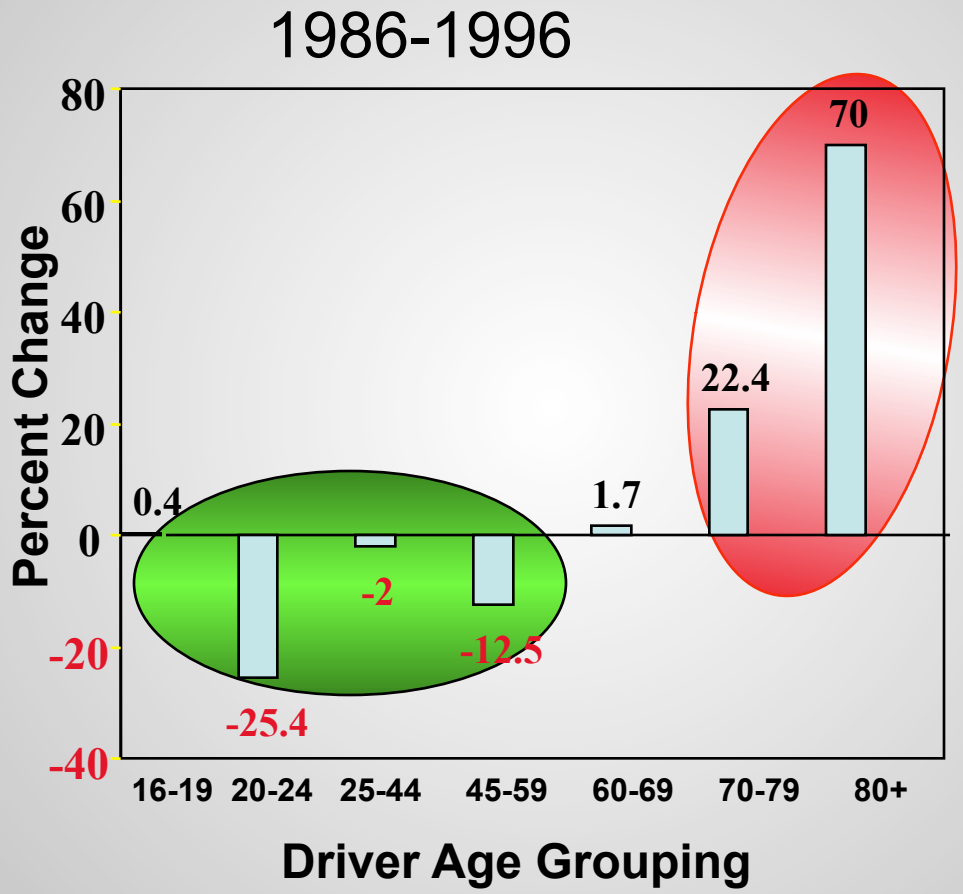
- No Pharmaceutical Industry support
- No Automotive Insurance Industry support

Driving & Dementia: Scope of the Issue

Reflect on Your Current Practice

- Who is at driving risk and why?
- Why is this issue important for me?
- What is my current approach to screening patients?
- What questions or concerns do I have about driving and dementia as a physician?

The Aging Driving Population



***Data Source**: An Over view of Senior Driver Collision Risk, Safety Policy Branch Ministry of Transportation of Ontario, September 9, 1998.

The U-Shaped Curve MVC/Km

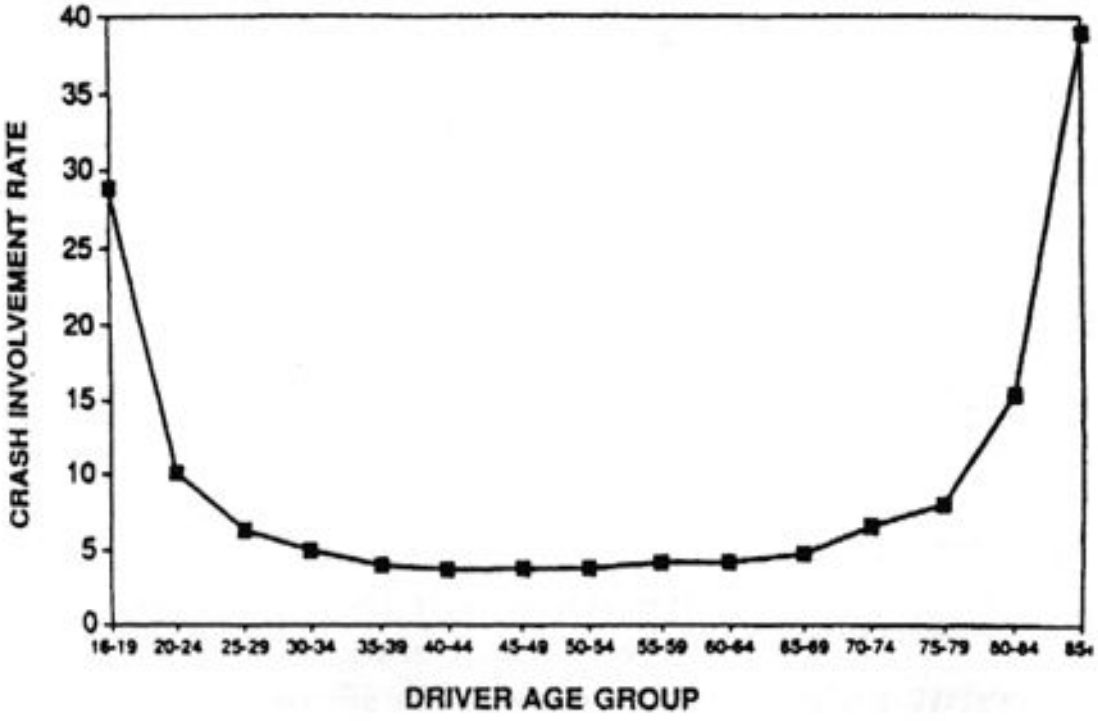
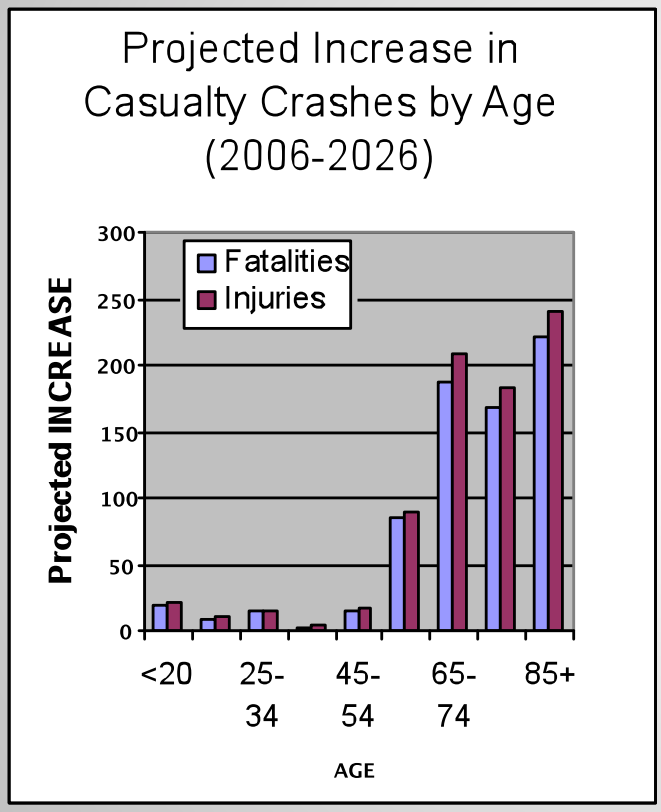
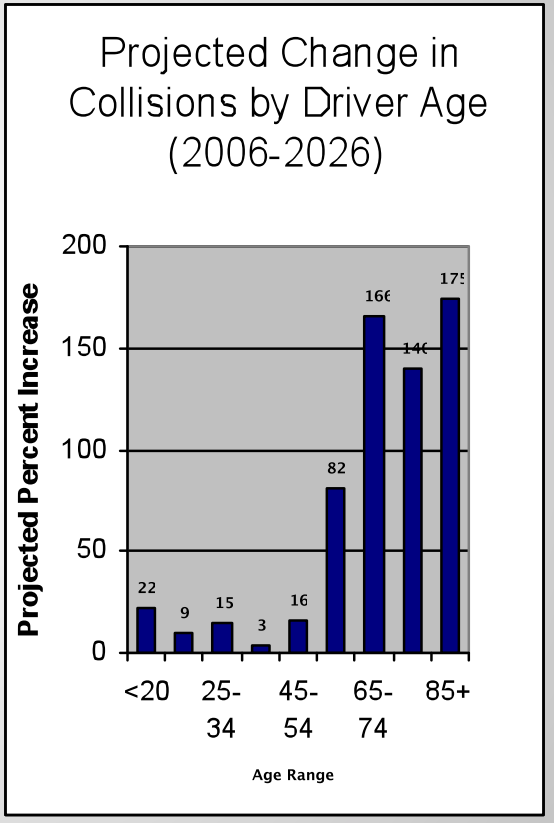


Figure 2. Rate of Motor vehicle crashes adjusted for miles driven according to driver's age.
SOURCE: Cerrelli E. *Older Drivers: The Age Factor in Traffic Safety.* Washington, DC: US Department of Transportation, National Highway Traffic Safety Administration, 1989

Projections





Source: L'Écuyer et al. (2006). Transport Canada

A Major Public Health Concern

- Seniors are over 4 times more likely to be seriously injured in a crash and hospitalized than drivers16-24 years of age.
- Treatment of injuries to seniors is more costly, recovery slower, less complete.
- Majority of crash-injured seniors were driving the vehicle.
- Most (3 of 4) crashes involving older drivers are multiple vehicle crashes.

Driving Risk: Not Primarily Age

- Medical conditions and medications are primary cause of declines in older driver competence.
- **Severity** and/or **instability** of conditions +/- **high doses** and/or **changing doses** of medications that impact on FUNCTION.

Medical Conditions

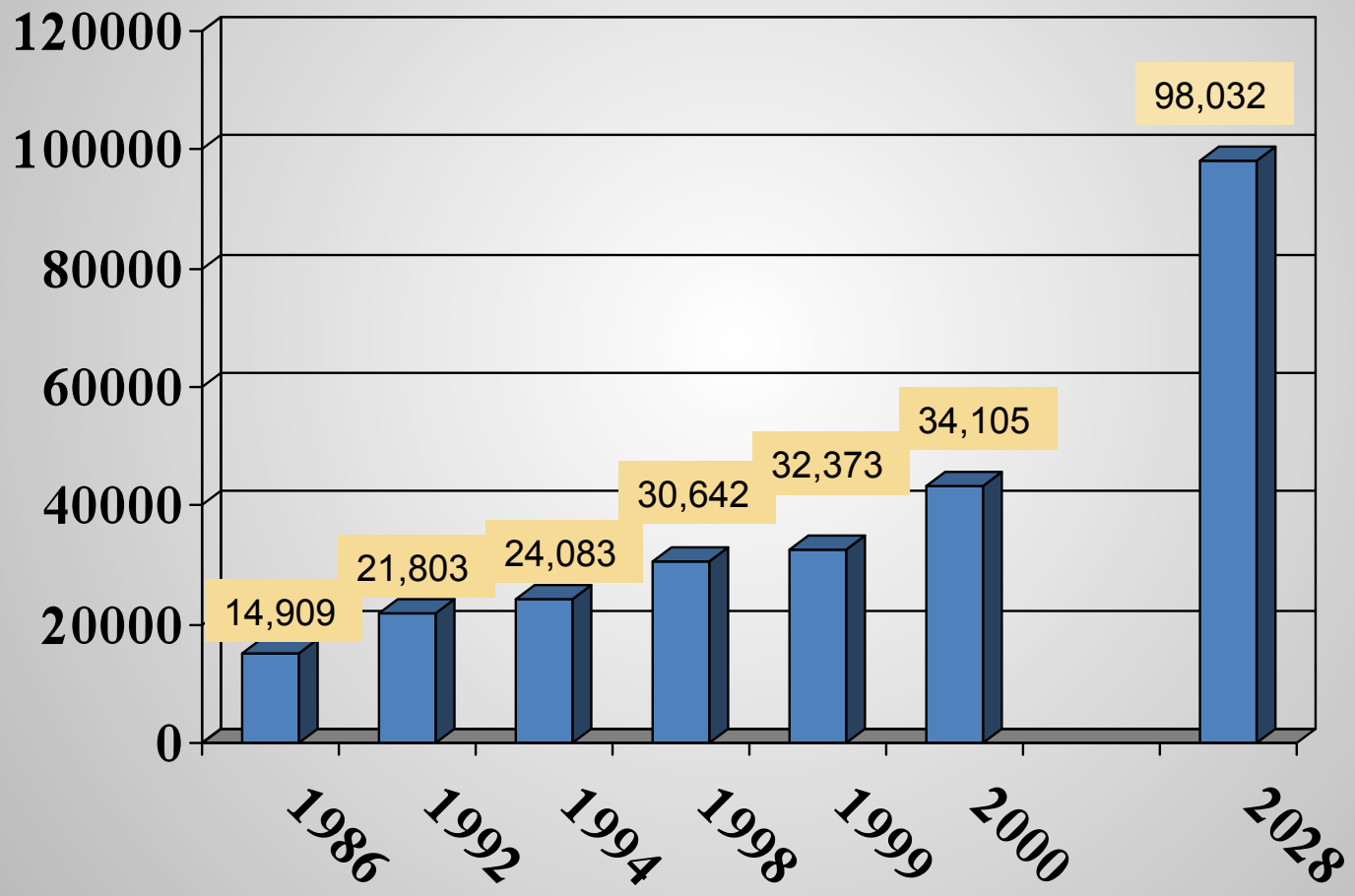
Physical: weakness; slow / limited movement

Sensory: vision loss; limited feeling in limbs

Cognitive/Perceptual: slowed thinking; decreased attention

Emotional: anxiety, panic reactions, impulse control problems

Estimated Numbers of Drivers with Dementia in Ontario[1]



[1] from Hopkins, et al., (2004)

BUT…

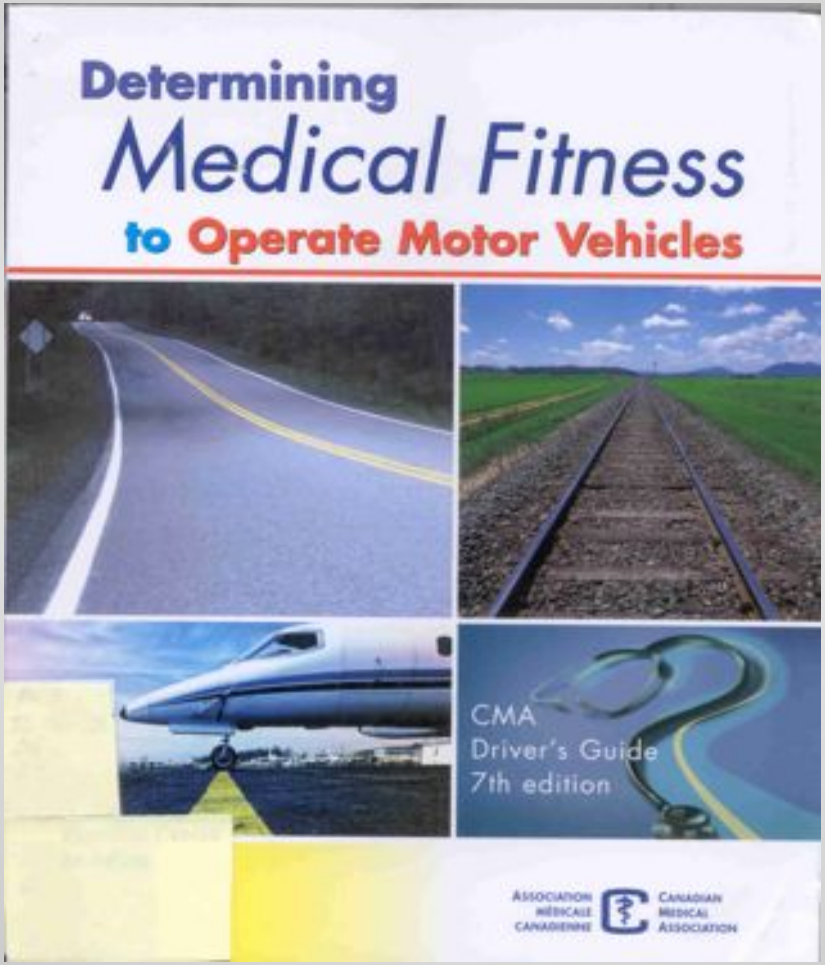
- Diagnosis of dementia does *not* automatically mean no driving.
- Diagnosis of dementia *does* mean:
  - You must ask if the person is still driving and you must document the response
  - You must assess and document driving safety and follow your provincial reporting requirements.

Driving & Dementia: Assessment Guidelines

Consensus Statements

- Swedish (1997)
- Australian Geriatrics Society (2001)
- American Academy of Neurologists (2000)
- Canadian Medical Association guidelines
- U.S. AMA/ NHTSA Physician's guide to Assessing and Counseling Older Drivers

www.drivinganddementia.org



Conclusions of Consensus Statements

- Those with moderate to severe dementia should not drive.
- Individual assessment for those with mild dementia.
- Periodic follow-up is required (every 6 - 12 mo.).
- “Gold standard” is comprehensive on-road assessment.

Limitations of Guidelines

- Based on expert opinion recommend tests such as MMSE, Clock Drawing, Trails B
- Lack of operating instructions
  - No guidance on HOW physicians apply such tests (e.g. how to respond to different scores, what cut-offs to use, fatal errors = automatic failure)

Driving & Dementia: Assessing Fitness-to-Drive

Realistic Expectations

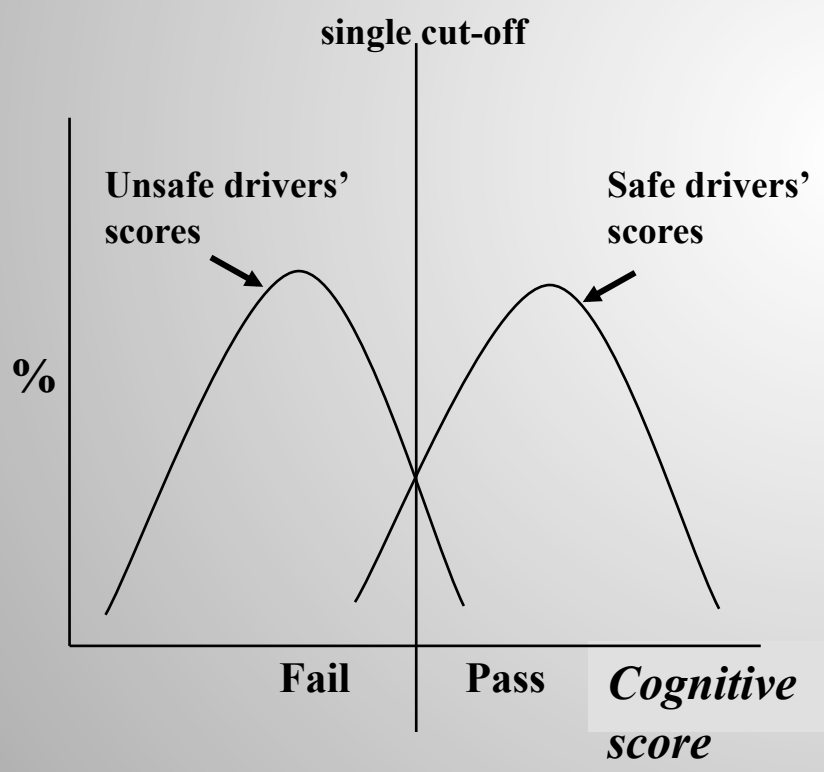
- No screening or assessment protocol will ever predict 100% of risk of Motor Vehicle Crash (MVC)
  - Only test stable intrinsic features
  - Cannot predict extrinsic factors
  - Full complexity cannot be addressed with time available in front-line clinical settings
- Therefore objective is *to improve* not to perfect the assessment of fitness to drive

Levels of Assessment

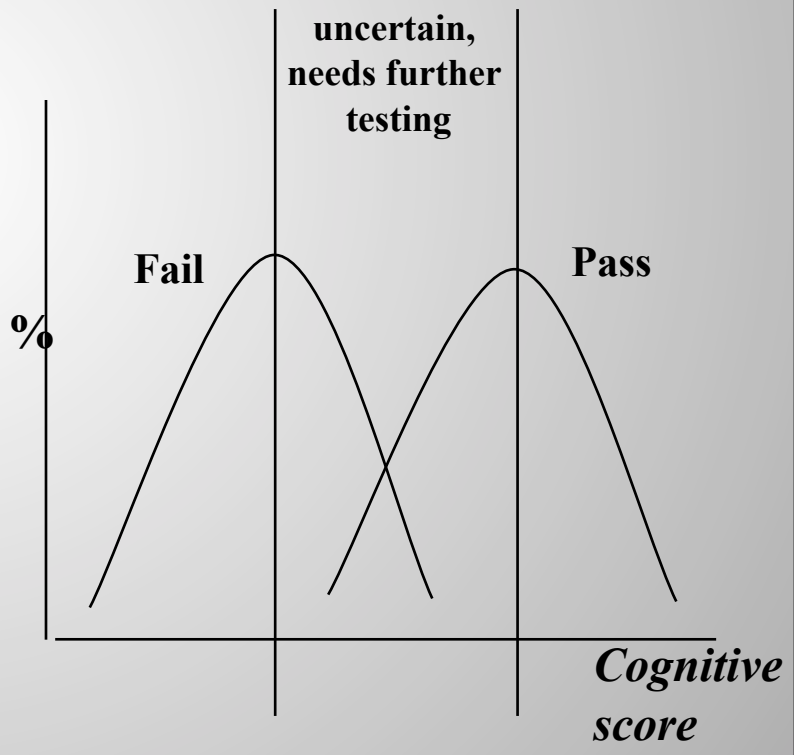
- MD
- Occupational Therapy / Neuropsychology
- On-road testing

Interpreting Test Results

Overlapping Cognitive Scores (Dichotomization)



Trichotomization



Applying Trichotomization

- Given the results of the cognitive test would you get in the car with the patient driving (or would you let a loved one drive with them)?
- Apply this approach to the most commonly recommended tests (MMSE, Clock Drawing Test, trails A & B)

Start By…

- Asking older patients if they drive!
- Looking at the GLOBAL CLINICAL PICTURE
  - Driving capacity depends on the whole picture including cognition, function, physical abilities, medical conditions, behavior, driving record
- Testing specific cognitive domains (judgement, visuospatial, executive function)

Specific Cognitive Domains

- Judgement — Test response to situation (fire, yellow light)
- Visuospatial — MMSE (Pentagons); Clock Drawing
- Executive function — Trails A and B; Clock Drawing; Animal-naming (> 15 in 1minute +

MMSE

- Provides a rough framework for assessing driving safety.
- Patients scoring under 20 are likely unsafe to drive.
- Higher scores are more difficult to interpret.

MMSE

- Look at where they lost points
  - Visuospatial – Pentagons
  - Concentration – serial 7s or DLROW
  - Major memory - year, month
- Look at how they performed
  - slowness, hesitation, anxiety or panic attacks, impulsive or perseverative behaviour, lack of focus, multiple corrections, forgetting instructions, inability to understand test, etc.

A Systematic Approach

- *The 10-Minute Office-Based Dementia and Driving Checklist*
  - Based on clinical acumen (experience and opinion)
  - **CANDRIVE acronym** (www.geriatricsandaging.com – Alzheimer – driving promotion)

10-Minute Office-Based Dementia and Driving Checklist

1. Dementia Type
2. Functional Impact of Dementia
3. Family Concerns
4. Visuospatial Issues
5. Physical Limitations
6. Vision/Visual Fields
7. Medications
8. Trail Making A and B
9. Ruler Drop Reaction Time
10. Judgement/Insight

10-Minute Office-Based Dementia and Driving Checklist

1. **Dementia Type**

- Generally unsafe - impact on executive function:
  - Lewy Body dementia
    - fluctuations, hallucinations, visuospatial problems
  - Frontotemporal dementias
    - if associated with behaviour (decreased impulse control vs. apathy) or judgment issues

10-Minute Office-Based Dementia and Driving Checklist

2. Functional Impact of Dementia.

- ADLs and IADLs as a hierarchy (Driving at top).
- Persons with dementia are ***unsafe to drive*** if:
  - Impairment of >1 IADL *due to cognition.*
  - **OR** Impairment of 1 or more personal ADLs *due to cognition.*

10-Minute Office-Based Dementia and Driving Checklist

3. Family Concerns - ask in a room *separate* from the patient:

- Does the family feel the patient is safe/unsafe?
- The granddaughter question.
  - Generally if the family feels the person is unsafe to drive, they are unsafe.
  - If the family feels the person is safe to drive, they *may still be unsafe*.

Family Concerns

- Absolute contraindications (must stop driving)
  - Near-misses with vehicles, pedestrians
  - Confusing the gas and brake
  - Missing stop signs/lights; stopping for green light
  - Not observing during lane changes/ merging

- Relative contraindication
  - Collisions and/or damage to the car
  - Getting lost
  - Traffic tickets
  - Deferring right of way inappropriately
  - Others honking/irritated with the driver

  (change from baseline)
  - Needing a co-pilot

10-Minute Office-Based Dementia and Driving Checklist

4. Visuospatial Issues

- Major abnormalities, likely unsafe
  - Intersecting pentagons on MMSE
  - Clock-drawing test
  - Cube drawing on MOCA

Clock Drawing Test

- Executive Function and Visuospatial function.
- Gestalt method: “The good, the bad or the ugly” (Trichotomization).
- Look at how they performed.
  - slowness, hesitation, anxiety or panic attacks, impulsive or perseverative behaviour, lack of focus, multiple corrections, forgetting instructions, inability to understand test, etc.

10-Minute Office-Based Dementia and Driving Checklist

5. Physical Inability to Operate a Car

- Musculoskeletal problems, weakness/multiple medical conditions affecting:
  - neck turn,
  - use of steering wheel/pedals,
  - ability to move feet rapidly
  - ability to feel the gas / brake pedals,
  - level of consciousness
- Review medical conditions that when severe, poorly controlled or changing rapidly can impact driving

Stable Illnesses

- Dementia
- Depression
- Diabetes (end organ damage – neuropathy, retinopathy)
- Vision
- Stroke
- Arthritis

Fluctuating Illnesses

- Delirium
- Sleep apnea (often need on-road)
- Parkinson's (often need on-road)
- Diabetes (hyper / hypoglycemic episodes)
- Cardiac disease (syncope, unstable angina)
- Seizures

10-Minute Office-Based Dementia and Driving Checklist

6. Vision/Visual Fields

- Significant problems including:
  - Visual acuity
  - Field of vision.

10-Minute Office-Based Dementia and Driving Checklist

7. Delirium inducing Drugs (causing drowsiness, slow reaction time, lack of focus)

- Alcohol, benzodiazepines, narcotics, neuroleptics, sedatives, anticonvulsants (Dilantin levels > 60)
- Anticholinergics—antiparkinsonian drugs, muscle relaxants (flexiril, dantrolene), tricyclic antidepressants, antihistamine (OTC), antiemetics, antipruritics, antispasmodics, urinary (Ditropan) and others

Drugs with Anticholinergic Effects

- Antidepressants
- Antipsychotics
- Antihistamines/ Antipruritics
- Antiparkinsonian
- Antispasmotics
- Antiemetics

Miscellaneous

Flexeril

Lomotil

Rythmodan

Tagamet

Digoxin

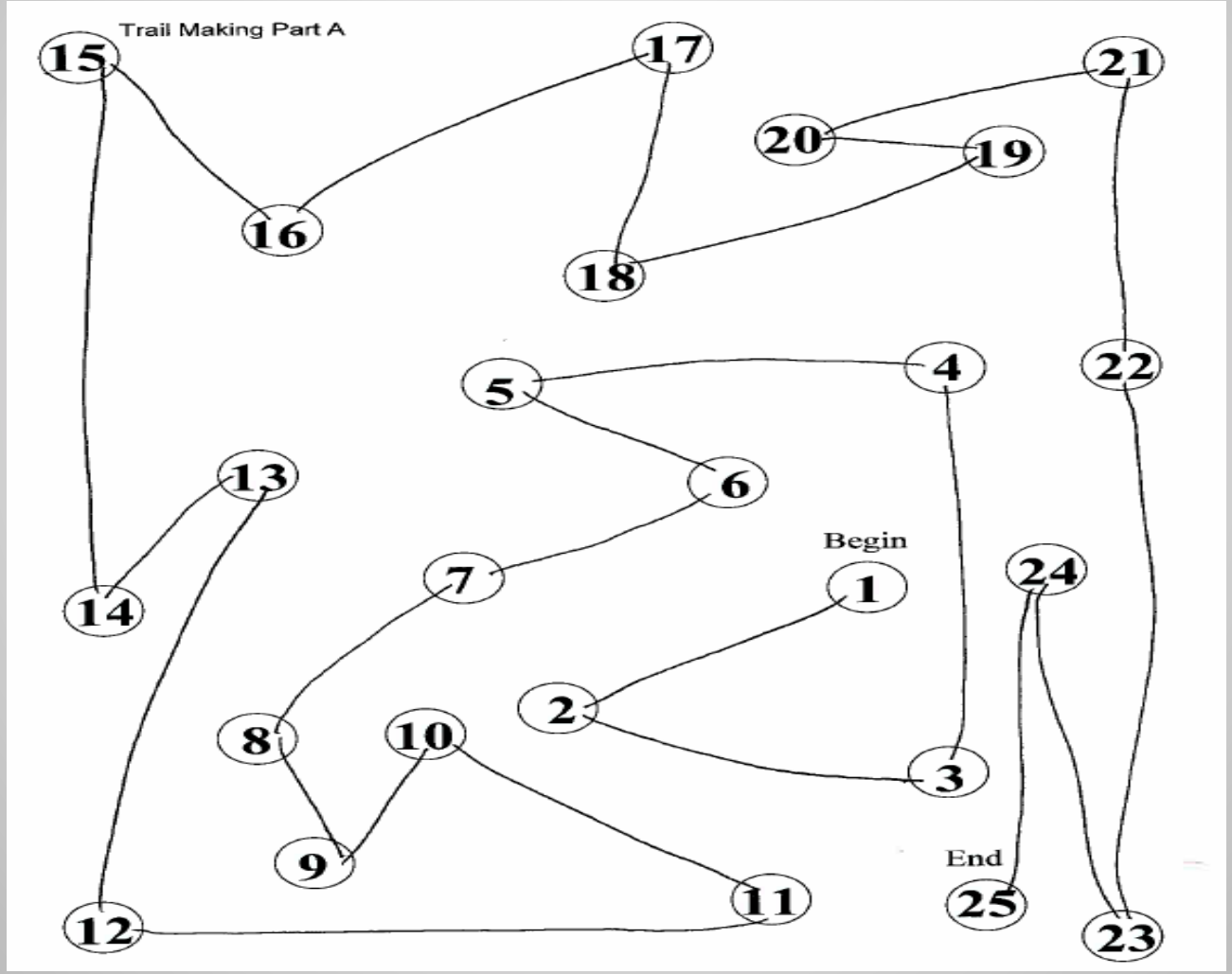
Lasix

10-Minute Office-Based Dementia and Driving Checklist

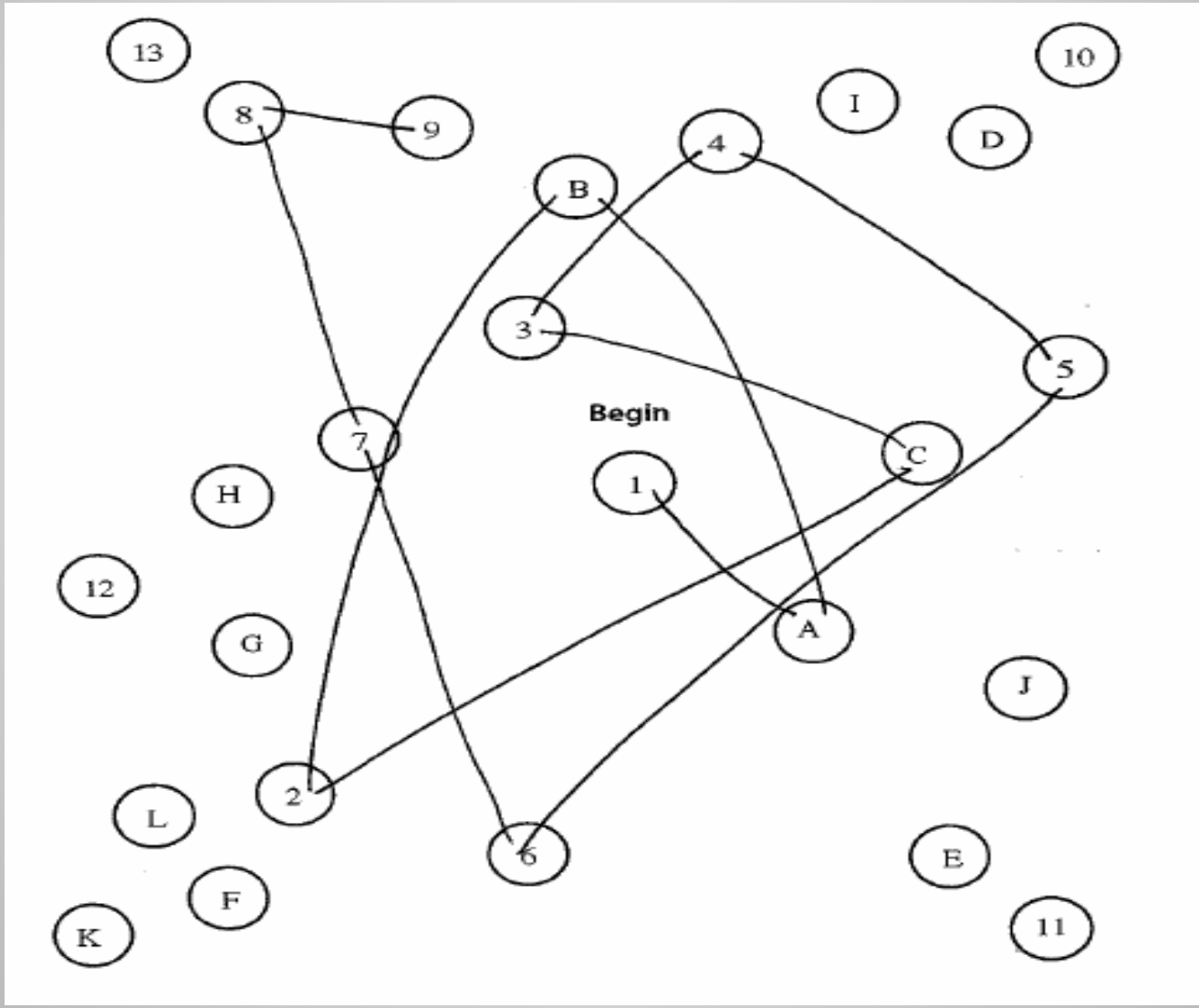
8. Trails A & B

- Trail Making A:
  - *Unsafe* = >2 minutes or 2 or more errors
- Trail Making B (Trichotomization):
  - *Safe* = <2 minutes and <2 errors (0 or 1 error)
  - *Unsure* = 2–3 minutes or 2 errors
  - *Unsafe* = >3 minutes or 3 or more errors
    - Longer patient takes, more errors they make, the more certain that they are unsafe

Trails A


Trail Making Part A
15
17
21
20
19
16
18
5
4
22
13
6
Begin
7
1
24
14
2
8
10
3
9
End
11
25
12
23

Trails B



10-Minute Office-Based Dementia and Driving Checklist

9. Ruler Drop Reaction Time Test (*Accident Analysis and Prevention* 2007;39:1056–63.)

- The bottom end of a 12 inch (30-cm) ruler is placed between thumb and index finger (1/2 inch (1 cm) apart) → let go and person tries to catch ruler (normal = 6-9 inches (15–22 cm); abnormal = 2 failed trials out of 3 trials

Reaction Time

- Slow reactions on routine clinical interaction (history, physical examination) may mean patient is already too slow to drive - needs further dynamic (i.e. timed) testing.
  - Stroke(s), delirium, depression, Parkinson's, Sleep Apnea
  - Look at Trails A and B if not certain if patient has cognitive slowing
  - May need on-road if Trails A and B do not answer the question

10-Minute Office-Based Dementia and Driving Checklist

10. Judgment/Insight

- Ask the person:
  - What would you do if you were driving and saw a ball roll out on the street ahead of you?
  - Other ideas/ scenarios?

Other Red Flags

- Hallucinations (should not drive)
- Delusions
- Disinhibition
- Impulsiveness
- Agitation
- Anxiety
- Apathy
- Depression

Trying it out…

- Review the following case and use the 10-Minute Office-Based Dementia and Driving Checklist to determine your findings.

OR

- Select a current case (patient with dementia or suspected dementia that may be at risk with respect to driving ability). Alternatively, if a suitable current patient does not exist select a previous patient with ample documented history.

Driving & Dementia: Disclosing Your Findings

Patient Perspective

- Driving is a means of independence.
- Others may rely on the person driving.
- Identity can be tied to owning and driving a car.
- Dementia may impact insight and the person's ability to understand why there is a need to stop driving.

Disclosure – Unfit to Drive

- Refer to Geriatrics and Aging article for approach

Disclosure – Unfit to Drive

- Give written notification.
  - Persons with dementia may forget that you told them they should stop driving.
  - Families need a document to show them to reinforce the message.
  - Can write a note on a prescription or can provide a more formal letter.

Sample Notification About Driving Safety

Name: _____

Date: _____

Address: _____

You have undergone assessment for memory/cognitive problems. It has been found by comprehensive assessment that you have _____ dementia. The severity is _____.

Even with **mild** dementia, compared to people your age, you have an 8 times risk of a car accident in the next year. Even with **mild** dementia, the risk of a serious car accident is 50% within 2 years of diagnosis.

Additional factors in your health assessment raising concerns about driving safety include:

_____

_____

_____

_____

As your doctor, I have a legal responsibility to report potentially unsafe drivers to the Ministry of Transport. Even with a previous safe driving record, your risk of a car accident is too great to continue driving. Your safety and the safety of others are too important.

_____ M.D. _____ Witness

Clinical Scenario

- You have found a patient unfit to drive and have informed them and their family. The patient says you are not permitted to send their medical information to the ministry of transportation or they will sue you and call the college. What do you do?

Clinical Scenario

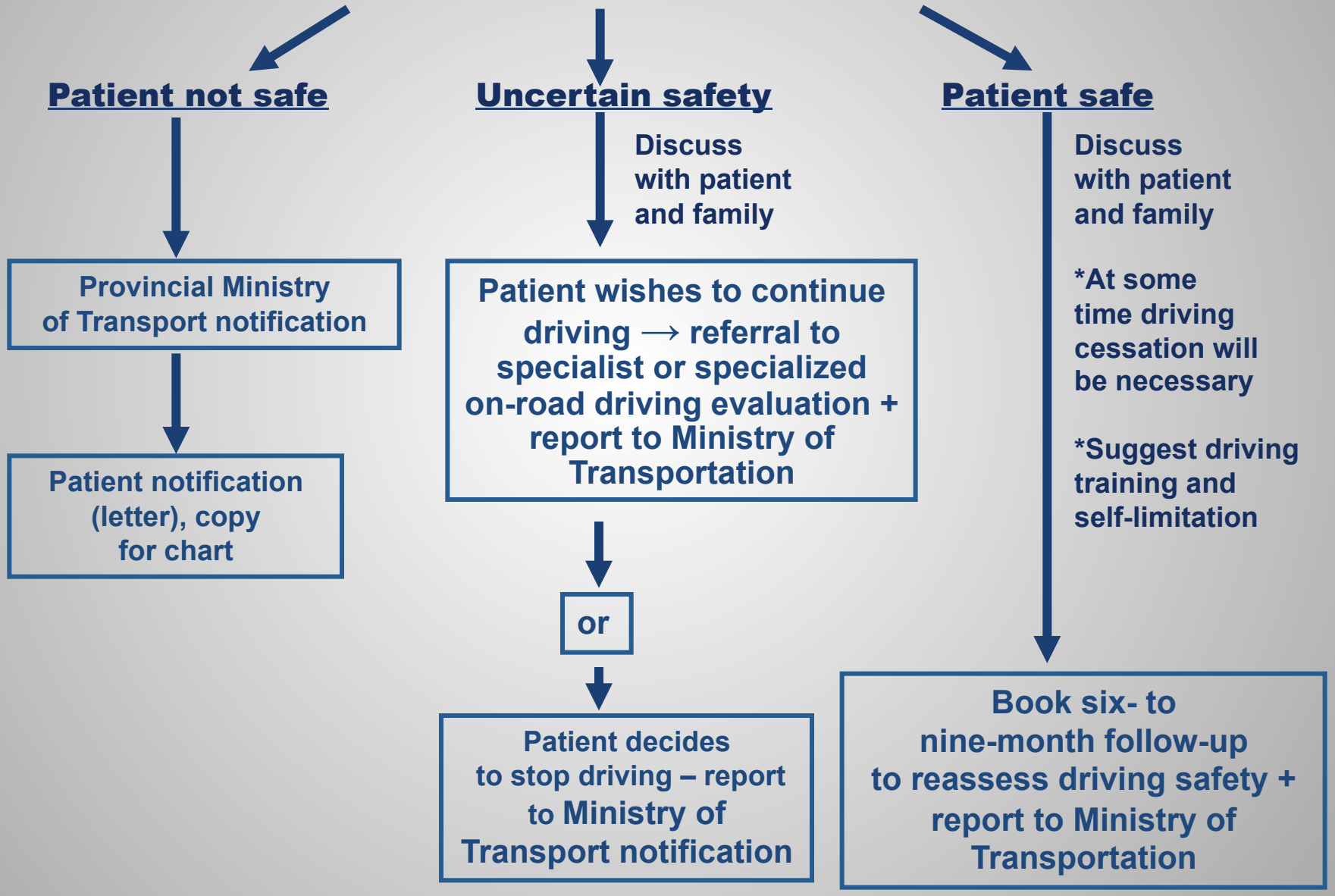
- A patient is in your office who is clearly unfit to drive home. MMSE 16/30. You tell them they should not drive home but they refuse to comply. You feel they are an imminent threat to public safety. What do you do?
  - Take keys?
  - Call family?
  - Call police?

Clinical Scenario

- You receive a report from a Sleep Specialist which reads ‘The findings of the sleep study indicate your patient may be unsafe to drive. I recommend you report them to the Ministry of Transportation”
  - What do you do?

Driving & Dementia: Reporting Unsafe Drivers & Ongoing Monitoring

Reporting Guidelines: Driving Fitness Findings



Reporting Requirements by Province

Province	Obligation to Report	Protection
British Columbia	Mandatory	Yes – report is privileged. No right of action against physician for reporting.
Alberta	Discretion	Yes – no liability for reporting.
Saskatchewan	Mandatory	Yes – report is privileged. No right of action against physician for reporting.
Manitoba	Mandatory	Yes - report is privileged. No right of action against physician for reporting.
Ontario	Mandatory	Yes - report is privileged and not admissible. No action against physician for complying with reporting.
Quebec	Discretion	Yes – no action against physician for reporting.
New Brunswick	Mandatory	Yes – no action against physician for reporting.

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Prince Edward Island	Mandatory	Yes - report is privileged. No right of action against physician for reporting.
Nova Scotia	Discretion	Yes – no action against physician for reporting.
Newfoundland	Mandatory	Yes - report is privileged and not admissible. No right of action against physician for complying with reporting.
Yukon Territory	Mandatory	Yes – no liability for reporting.
North West Territory	Mandatory	Yes – there can be no action unless physician acted maliciously or without reasonable grounds. Report is privileged.

K035 – Ontario Billing Code

Medical Condition Report

Ontario

Section 203 of the Highway Traffic Act requires that all legally qualified medical practitioners must report to the Registrar of Motor Vehicles the name, address and clinical condition of any patient sixteen years of age or older who, "is suffering from a medical condition that may make it dangerous for the person to operate a motor vehicle". To simplify the reporting process, the Ministry of Transportation has created this form. Mail or fax to: Registrar of Motor Vehicles, Medical Review Section, Ministry of Transportation, 2680 Keele Street, Downsview, ON M3M 3S5. Tel. No.: 416-235-1773 or 1-800-268-1481. Fax No.: 416-235-3400 or 1-800-304-7889.

Patient Information

Last Name | First Name | Middle Initial | Fee Schedule Code (K035)

Street No. and Name or Lot, Con. and Twp. | Apt. No.

City, Town or Village | Postal Code

Date of Birth (Y / M / D) | Male | Female | Driver's Licence No. (if available)

For your convenience, the following is a list of the more common medical conditions that are reported to MTO, to be marked with an "X". If the condition you are reporting is not listed, please indicate it in the section marked "Other".

- ☐ Alcohol Dependence
- ☐ Drug Dependence
- ☐ Seizure(s)-Cerebral
- ☐ Seizure(s)-Alcohol related
- ☐ Heart disease with Pre-syncope/Syncope/Arrhythmia
- ☐ Blackout or Loss of consciousness or Awareness
- ☐ Stroke/TIA or head injury with significant deficits
- ☐ Both Visual Acuity and Visual Field Impairment
- ☐ Visual Acuity Impairment
- ☐ Visual Field Impairment
- ☐ Diabetes or Hypoglycemia or other metabolic diseases-Uncontrolled
- ☐ Mental or Emotional Illness-Unstable
- ☐ Dementia or Alzheimer's
- ☐ Sleep Apnea-Uncontrolled
- ☐ Narcolepsy-Uncontrolled
- ☐ Motor Function/Ability Impaired
- ☐ Other (specify): _____

Optional

To expedite your patient's file, please provide further elaboration of clinical condition (if available) or attach as a separate report. Diagnosis; Other Relevant Clinical Information (i.e current status - including results of investigations, medication(s), treatment and prognosis); and whether or not the condition is a serious risk to road safety, threat to road safety is unknown or condition is temporary - weeks/months.

_____

_____

_____

_____

Date of examination upon which this report is based: (Y / M / D) | How long has this person been your patient? _____

- ☐ Patient is aware of this report.
- ☐ I wish to be notified if my patient requests a copy of this report, as releasing this report pursuant to a request under the Freedom of Information Act may threaten the health or safety of the patient or another individual.

For MTO Use Only (030)

Physician's Last Name, First Name and Middle Initial

Street No. and Name or Lot, Conc. and Township | Apt. No.

City, Town or Village | Postal Code | Telephone No.

- ☐ Family Physician
- ☐ Emergency Room Physician
- ☐ Specialist _____ (Specialty)
- ☐ Other _____

Doctor's Signature _____ Date of Report (Y / M / D)

How to Report

- Mild dementia (no concerns re: driving).
  - "Patient has mild dementia with MMSE ___, Trails B ___. I have not noted any evidence to suggest they are not fit to drive but feel they should be re-evaluated every __ months."
    - Re-evaluation - 6 or 12 months based on clinical judgement.
    - Warn family to notify of cognitive change or signs of delirium.
    - Report if risk that patient will not return for follow-up.
- Advise the patient to start planning for eventual driving cessation.

How to Report

- Moderate to severe dementia.
  - "Patient is not safe to drive due to the following findings: _____."
- How much information can we disclose?
  - If potentially litigious then only include the findings of the testing.
  - If patient tells you that you cannot report them then write: "patient will not provide consent to forward my findings."

Fitness to Drive Unclear: Further Assessment Required

- Notify jurisdictional authorities as per provincial reporting requirements
  - "Fitness to drive unclear – more testing needed"

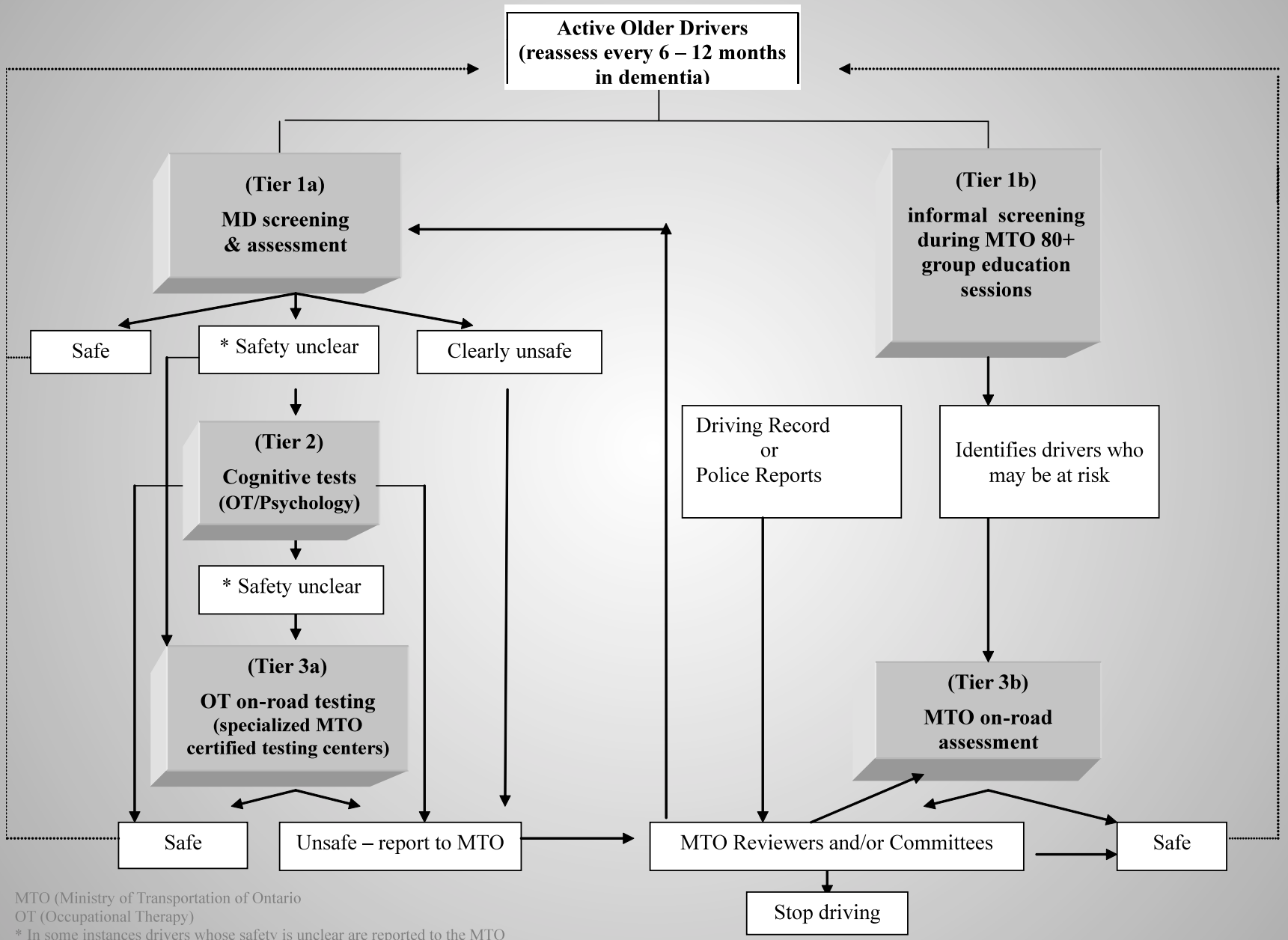
  OR

  - "Deficits may be temporary (e.g. delirium) – requires follow-up"

Specialized Driving Assessment

- Cognitive tests (Neuropsychologist, OT)
  - can assess the more obviously impaired
- Driving Simulator Evaluation
  - Not fully acceptable for determining fitness to drive
  - Insight to the evaluator for on-road assessment
- On-Road Assessment (OT / Driving Instructor)
  - Present Gold Standard
  - Not the same as a Ministry on road in Ontario
  - $50 - $800 depending on province

Figure 1: Three-Tier Model of Driving Assessment in Ontario



MTO (Ministry of Transportation of Ontario
OT (Occupational Therapy)
* In some instances drivers whose safety is unclear are reported to the MTO

Summary

Key Points

- If dementia is diagnosed, driving must be asked about, formally assessed, and documented.
- Physicians can perform a comprehensive driving safety clinical evaluation in approximately 15 to 20 minutes (particularly if they already know the patient).
- If you are unsure of safety, refer to specialized assessment or specialized on-road testing.
- In dementia, driving safety must be reassessed every 6 to 12 months.

Final Reflection

- Decide on a plan going forward for patient care in those who are at risk drivers due to dementia:
  - What will I continue to do?
  - What will I do differently?
  - How will I incorporate any changes?
  - What difference do I think these changes will make in patient care?
  - What are the challenges/barriers to implementing these changes and how could these be overcome?
  - What more do I need to know and how will I find out?

Resources

- Alzheimer Knowledge Exchange www.drivinganddementia.org
- Geriatrics and Aging (leading Geriatric CME journal) www.geriatricsandaging.ca
- CMA: Determining Medical Fitness to Drive: A Guide for Physicians. Canadian Medical Association Driver's Guide 7th edition www.cma.ca/index.cfm/ci_id/18223/la_id/1.htm
- Driving and Dementia Tool Kit for Family Physicians (Dementia Network of Ottawa-Carleton) www.rgpeo.com or www.CanDRIVE.ca
- US Physicians' guide to Assessing an Counseling Older drivers http://www.nhtsa.dot.gov/people/injury/olddrive/OlderDriversBook/pages/Introduction.html
- To learn about ongoing research see www.candrive.ca