Objectives

• How are governments responding to concerns about aging drivers
• What level of cognitive impairment constitutes a driving risk?
• Which screening cognitive tests are most reliable/appropriate?
• What collateral information is needed
• Which secondary/referral tests should be used e.g. Driveable?

Case #1

• 80 year old man, saw MD for routine driving screen
• MMSE 27/30 – score entered into driving physical
• No significant medical, cognitive or functional issues
• DMV called him for DriveAble – failed computerized portion – lost license, no appeal
• Referred to geriatric clinic

Case #2 72 year old male

• Referred for memory loss
• Gradual onset, some impairment in IADL function
• Still driving – wife has no concerns
• MOCA 13/30
• Referred to DriveAble, donepezil started
• Returns at 3 months – no word from DMV, MOCA 21/30; another form sent to DMV
• At 6 months; cognition stable, no DMV action

Case #3 84 Yr male

• Referred for memory changes
• Recently lost while driving
• MMSE 22/30; dx’ed mild dementia put on donepezil
• Referred to DriveAble – passed Road Test
• Seen 6 months later – cognition stable, still drives and gets lost in local area
• Discussed with DMV – no regular re-exam without MD prompt – send for standard driving test

Case #4 78 year old man

• Referred for cognition – came by himself
• Looks very fit, denies any problems with IADLs
• German first language
• MMSE 21/30, MOCA 19/30
• Referred for DriveAble
• 1 month later – caught driving wrong way on highway, buying gifts for imaginary people

Aging & adverse driving outcomes

• Older drivers less likely to be involved in a crash (less driving), but not when adjusted for km driven

Risk due to Accumulation of comorbidities / drugs
Age is a surrogate for comorbidities

Crash due to inexperience or risk taking behaviour
Mild Cognitive Impairment

- Prevalence is approximately 15% (Mayo Clinic study between 70 and 89 yrs)
- Amnestic MCI usually considered to be early stage of Alzheimer’s (10%) — tends to progress
- Non-amnestic MCI – variety of causes, often non-progressive (5%)
- Distinguished from dementia by impact on functional activities

Additional Outcomes:
- ER visits for depression increased from 19.15 events per 1000 patients to 23.91 events (relative increase 27%, CI 17-37)
- Fewer patient visits to the responsible physician in the year after the warning than yr before in 29% of patients

Conclusions: Physicians’ warnings to potentially unfit drivers associated w/ reduction in risk of crashes
Fitness to Drive in the Senior Population — Focus on Cognitive Assessment

**Cognitive screening of older drivers does not produce safety benefits.** Accid Anal Prev. 2012 Mar

- Analysis of Danish fatal road accidents before and after implementation of mandatory cognitive screening for elderly
- No change in frequency of elderly drivers involved in fatal accidents after screening
- Increased number of fatalities of unprotected elderly in road accidents after screening
- Suggests that harm may come from mandatory screening programs

**Missing drivers with dementia: antecedents and recovery** J Am Geriatr Soc. 2012 Nov

- Describes Silver Alert system in Florida
- 156 cases of missing drivers; mostly male; 5% mortality
- 32% were known to have exhibited unsafe driving in the past
- 60% were found outside their count, 10% found in another state; most were found by police
- Most cases went missing while on routine, care-giver approved trips to nearby destinations

**The aging driver in BC: Rules**

- At age 80, drivers require a medical exam to determine medically fitness to drive and every 2 years after 80
- No specific age at which licenses are suspended
- All provinces protect vs litigation if report in good faith
- Legal requirement to report medical condition that "makes it dangerous to the patient or to the public for the patient to drive a motor vehicle, and continues to drive a motor vehicle after being warned of the danger"

2010 BC Guidelines for determining fitness to drive
BC Motor Vehicle Act Mandatory Reporting, Protocols, & Confidentiality, Section 229

**Driving: The Super ADL**

- **Cognitive functions**
  - Attention (divided, selective, sustained)
  - Short term memory/long term memory
  - Visuospatial abilities
  - Complex reaction time
  - Executive functioning
- **Vision**
  - Acuity
  - Visual Fields
  - Contrast sensitivity
  - Disability glare

Motor Functions
- Coordination
- Range of motion
- Dexterity
- Gross motor abilities
- Strength
- Flexibility
- Reaction time

**An approach: History**

- Cognitive impairment & driving
  - Moderate to severe dementia = contraindication
  - Inability to perform multiple IADLs or any BADL
  - Mild dementia = individual assessment; refer for testing if appropriate; reevaluate q6 months
  - BC guidelines: Do SIMARD and Driveable if screen is positive

- Cognitive impairment due to... CKD, COPD, stroke, Parkinsons, TBI, general debility? Do SIMARD MD & Driveable

Canadian Consensus Conference on Dementia:
- Most cases were found by police
- Most cases went missing while on routine, care-giver approved trips to nearby destinations

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In-office assessment tools: how useful are they?

- Folstein MMSE
- Clock Drawing
- Trails A/B
- MoCA
- SIMARD MD

In-office assessment tools: MMSE

- Variable association with driving fitness, not designed to assess driving capacity
- Insensitive to MCI, persons with high education can perform well even with mild dementia
- Scores <20 usually associated with moderate dementia

In-office assessment tools: MoCA

- No cut-off points that have been well validated to predict fitness to drive
- Scores <20 likely associated with mild dementia

In-office assessment tools: Trails B

- Executive function, visual attention, task switching, speed processing
- Cutoffs of >133 secs, >147 secs, >180 secs, ≥3 errors in the literature = unsafe
- Some correlation to driving performance
- Recommended by AMA as part of ADReS, CFP

Molnar FJ, et al. Clinical utility of office-based cognitive predictors of fitness to drive in persons with dementia: a systematic review. JAGS 2006; 54; 1809

In-office assessment tools: Clock

- Assesses visuospatial and executive functions, abstraction
- Several different scoring systems
- No cut-off scores that have been well validated; variable associations
- Recommended by AMA as part of ADReS (assessment of driving related skills)
Testing Psychomotor speed

- Ruler drop test
- TUG
- Gait speed
- Trails B

Collateral information

- Gathering information on family’s opinion about driving safety – both over and under estimation of risk
- Gathering information about functional status apart from driving – allows a better determination of cognitive diagnosis i.e. distinguishing MCI from dementia and mild from moderate dementia

Functional Activities Questionnaire

- Writing checks, paying bills, balancing checkbook
- Assembling tax records, business affairs, or papers
- Shopping alone for clothes or groceries
- Playing a game of skill, working on a hobby
- Using kitchen equipment, safety in kitchen
- Preparing a balanced meal, following a recipe
- Keeping track of current events
- Understanding, discussing TV, book, magazine
- Remembering appointments, family occasions, holidays,
- Taking medications
- Arranging transportation e.g. bus, taxi, driving

DriveAble in BC

- Contracted by government to test seniors for driving competence
- $300 fee waived if referred by MD
- Two-stage testing – computerized test as screen
- Road test only if borderline on computer test
- Grass-roots seniors campaign caused change in rules
- All comers now eligible for road test

Progressive Car Insurance

- Gives clients a device which plugs into diagnostic port on steering wheel
- Analyzed by company after 30 days
- Discount applied if they calculate that you are a safe driver
- Work is being done on using GPS/video to assess driver competence – correlates well with road test

Conclusions

- The purpose of the physician screen re driving is to detect undiagnosed dementia
- Additional consideration is needed to assess psychomotor function and the traditional medical contra-indications to driving
- Secondary assessment of senior’s driver competence is an evolving field – technology may provide better and more cost-effective solutions but DriveAble is a reasonable approach