The Fast and the Furious? Insights into Driving in At-Risk Populations

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Faculty/Presenter Disclosure

• Faculty: Bonnie Dobbs

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- Material/Learning Objectives and/or session descriptions were developed and reviewed by the Planning Committee composed of experts/family physicians/allied care professionals responsible for overseeing the program's needs assessment and subsequent content development to ensure accuracy and fair balance.
- Consideration was given by the Planning Committee to identify when speakers' personal or professional interests may compete with or have actual, potential, or apparent influence over their presentations.
- Information and/or recommendations in the program are evidence- and/or guidelines-based, and the opinions of the independent speakers will be identified as such.
Learning Objectives

1. Describe the population of drivers who are most likely to be medically at-risk/impaired.
2. Describe the licensing and reporting legislation related to medically at-risk/impaired drivers in their respective jurisdictions.
3. Provide information on and access to resources for identifying, assessing, and reporting medically at-risk/impaired drivers.
4. Discuss office assessment tools for prediction of driver ineligibility.
5. Provide information about community supports that can facilitate the transportation mobility of drivers whose licenses have been revoked.
6. Discuss strategies to approach families with concerns about elderly drivers.

Medically At-Risk Driver Centre (MARD)

- Research and Knowledge Translation Centre in the Department of Family Medicine, University of Alberta
- Studies on:
  - Effects of medical conditions on driving
  - Development of screening tools to assist physicians in identifying medically impaired drivers
  - Assessment of the transportation needs of seniors
  - Development of resources to enable transportation mobility of seniors in rural and urban areas
Fatality Rates by Miles Travelled

![Fatality Rates by Miles Travelled Graph](source)

Insurance Institute of Highway Safety, 2015

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The Role of Medical Conditions

Literature Reviews


### Relative Risks of Accident Involvement of Medical Conditions (Vaa, 2003)

<table>
<thead>
<tr>
<th>Main Category</th>
<th>Relative Risk</th>
<th>95% CI</th>
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</thead>
<tbody>
<tr>
<td><strong>Lower Risk</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vision Impairment</td>
<td>1.09*</td>
<td>1.04–1.15</td>
</tr>
<tr>
<td>Hearing Impairment</td>
<td>1.19*</td>
<td>1.02–1.40</td>
</tr>
<tr>
<td>Arthritis/Locomotor Disability</td>
<td>1.17*</td>
<td>1.04–1.36</td>
</tr>
<tr>
<td>Cardiovascular Diseases</td>
<td>1.23*</td>
<td>1.09–1.38</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>1.56*</td>
<td>1.31–1.86</td>
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<tr>
<td><strong>Medium Risk</strong></td>
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<td></td>
</tr>
<tr>
<td>Alcoholism</td>
<td>2.00*</td>
<td>1.89–2.12</td>
</tr>
<tr>
<td>Neurological Disease</td>
<td>1.75*</td>
<td>1.61–1.89</td>
</tr>
<tr>
<td>Mental Disorders</td>
<td>1.72*</td>
<td>1.48–1.99</td>
</tr>
<tr>
<td>Drugs and Medicines</td>
<td>1.58*</td>
<td>1.45–1.73</td>
</tr>
</tbody>
</table>

* P < .05

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### Do Older Drivers with Medical Impairments Still Drive?

- **Level 5** - Unable to hear in a group conversation even with hearing aid
- **Level 6** - Unable to hear at all

- **Level 5** - Very forgetful. Unable to problem solve
- **Level 6** - Unable to remember anything at all

- **Level 5 or 6** - Unable to walk alone, even with walking equipment

Turcotte, 2012
Determining Fitness to Drive

Fitness to Drive Standards and Guidelines

• Canadian Council of Motor Transport Administrators (CCMTA) Medical Standards
  • Used by provincial and territorial governments to establish whether drivers (both private and commercial) are medically fit to drive
  • Driver Fitness and Monitoring adheres to these guidelines

• National ‘Fitness to Drive’ Guidelines
  • Developed by the Canadian Medical Association to assist physicians and allied health professionals in the evaluation of medical fitness to drive
  • Determining Medical Fitness to Operate Motor Vehicles (9th Ed.) (2018)
Provincial Reporting Requirements

<table>
<thead>
<tr>
<th>Province/Territory</th>
<th>Mandatory Reporting</th>
<th>Protection for Reporting</th>
<th>Privileged</th>
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<tr>
<td>Alberta</td>
<td>x</td>
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<td>✓</td>
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<tr>
<td>British Columbia</td>
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<tr>
<td>Manitoba</td>
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<td>✓ ✓</td>
<td>✓</td>
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<tr>
<td>New Brunswick</td>
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<td>✓</td>
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<tr>
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<tr>
<td>Yukon</td>
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<td>✓ ✓</td>
<td>Not addressed</td>
</tr>
</tbody>
</table>

* Protected unless the physician acts falsely or maliciously
** Protected as long as the physician acts in good faith
*** Protected unless the physician acts maliciously or without reasonable grounds (Joulie, 2017).

Physician Awareness/Knowledge of Legislation/Guidelines and Reporting

- ~ 20 studies in this area (1993-2018)
- In majority of studies, physician awareness/knowledge of legislation and/or fitness to drive guidelines poor (28%-89% unaware)
- Trends:
  - Greater awareness in specialists than FPs
  - Greater awareness in mandatory reporting jurisdictions
  - Physicians from mandatory reporting provinces more likely to report ‘unsafe’ drivers to licensing authority vs. those from discretionary reporting provinces
  - Specialists more likely to report ‘unsafe’ drivers than FPs
Effectiveness of Mandatory Reporting

![Graph showing percentage in crashes by year (1993-2006).](image)

- **Four-fold Difference in Crashes**
- **Rapid decrease in crashes for reported drivers**

**Fig. 4.** Percentage in crashes by year (1993-2006). Meuser et al., 2009

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### Barriers to Reporting

- Identified barriers include:
  - Lack of awareness of the legal requirement for reporting
  - Lack of knowledge of guidelines and/or process for reporting
  - Lack of remuneration
  - Concern re: impact of doctor-patient relationship
  - Concern re: breach of confidentiality

See Bruchacher et al. (2017)

The duty to report prevails over a physician’s duty of confidentiality

CMA (2017)
Facilitating Reporting of Medically Unfit Drivers

- Physician education and training
- Identified areas
  - Who should be reported (e.g., what conditions to report)
  - The process and procedures for reporting
  - Clarification re: physician legal liability
  - Compensation for reporting
  - Availability of resources to support physicians, patients, and families

Common In-Office Screening Tools for Cognitive Impairment

- Number of screening tools available
  - MMSE
    - Limited sensitivity, good specificity
    - Copyrighted
    - Does not test executive function (Hogan et al., 2005; Crizzle et al., 2012; Joseph et al., 2014; Hollis et al., 2015)
  - MoCA
    - Good sensitivity for MCI, mild dementia, limited specificity
    - Limited body of supporting evidence (Esser et al., 2015; Kwok et al., 2015)
  - Trails A & B
    - Systematic review (Dobbs & Shergill, 2013)
Trails A & B Systematic Review (2013)

<table>
<thead>
<tr>
<th>Case points from demarcating/median guidelines</th>
<th>Pass</th>
<th>Fail</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
<th>PPV (%)</th>
<th>NPV (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMT-A time ≤59.5 s</td>
<td>22</td>
<td>21</td>
<td>27</td>
<td>86</td>
<td>52</td>
<td>83</td>
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<td>TMT-B time &lt;130 s</td>
<td>50</td>
<td>31</td>
<td>88</td>
<td>59</td>
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<td>88</td>
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<td>Cut points from normative data</td>
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<td>TMT-A time ≤68 s</td>
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<td>65</td>
<td>27</td>
<td>81</td>
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<td>TMT-B time ≤61 s</td>
<td>39</td>
<td>61</td>
<td>80</td>
<td>86</td>
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<td></td>
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<tr>
<td>Cut points that maximize sensitivity and specificity</td>
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<td>TMT-A time ≤43.50 s</td>
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<td>68</td>
<td>95</td>
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<td>TMT-B time ≤40.50 s</td>
<td>77</td>
<td>77</td>
<td>94</td>
<td>93</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PPV: positive predictive value, NPV: negative predictive value.
1: No participant made more than one error, thus no cut points of 3 or 4 were used as opposed to 5 (pass) and 12 (fail) used in the Budak et al study [8].
No participant made more than one error on TMT-A, resulting in a cut point of >1 error.
1: There was no cut point on TMT-A (error) that provided a good balance between sensitivity and specificity.

Only TMT-A and -B total time had moderate discriminative abilities

The SIMARD MD

A Scientifically-Based Screening Tool for the Office-Based Identification of Cognitively Impaired Drivers

Initial Study (n = 181)
- Cog Impaired (n = 146) and Healthy Controls (n = 35)

Validation Study (n = 244)
- Cog Impaired (n = 192) and Healthy Controls (n = 52)


See https://www.ualberta.ca/medically-at-risk-driver-centre/simard-md for links to the SIMARD MD
The SIMARD MD Cut-Points

Initial Study: Percent predicted to fail and subsequently failed = 86%
Percent predicted to pass and subsequently passed = 84%

Validation Study: Percent predicted to fail and subsequently failed = 80%
Percent predicted to pass and subsequently passed = 87%

On-Road Assessments
• Differ across jurisdictions
• In Alberta:
  - AHS Driving Assessment Programs/Centres
    - Edmonton: Driver Evaluation and Training Service (DETS) (GRH) (Tier 3)
    - Chronic Disease Management (Tier 2a)
  - Calgary: Community Accessible Rehabilitation (CAR) Program (Sheldon M. Chumir Health Centre) (Tier 2a)
  - Red Deer: Red Deer Hospital (Tier 2a)
  - Camrose: Camrose Driver Evaluation Service (Tier 2b)
  - Tofield: Tofield Driver Evaluation Service (Tier 2b)

- Clinical evaluations only
- On-road incorporated when deemed appropriate

DriveABLE In-Office and On-Road Assessment:
- Calgary
- Edmonton
- Leduc
- Lethbridge
- Medicine Hat
- Red Deer
- Sherwood Park
- St. Alberta

Standardized across site
Driver Fitness and Monitoring

- Driver Medicals starting at age 75 and Q2 years thereafter
- Electronic Medical Report
  - Medical Examination for Motor Vehicle Operators
  - https://www.transportation.alberta.ca/content/docType45/Production/ElectronicMedicalReport.pdf

Transportation Outside the Private Vehicle

Use of Public Transit as Main Form of Transportation

Data point for men 85+ absent as the data are too unreliable to publish

Turcotte, 2012
Enabling Transportation Mobility

Alternate Transportation for Seniors

https://mard.med.ualberta.ca/mard/db/index.cfm
MARD Rural and Remote ATS Pilots

1. Wainwright and District Handivan Society – implementing a rural ATS service
2. Wetaskiwin – Implementing Ride-Scheduling Software
3. Pincher Creek – Developing a Rural ATS Service
4. Big Lakes – Developing and implementing a rural remote ATS service
5. West Yellowhead Region – Developing and implementing a rural regional service
6. Sturgeon Region – Developing and implementing a rural regional service

Strategies to Approach Families with Concerns about Elderly Drivers
Strategies and Resources

• Start the conversation early
  • Most of us will have to transition from driver’s seat to passenger seat
  • Age-triggered testing (Driver’s Medical) a good time to start
• Expect resistance
• Important to address the “symbolic loss” of the license
• Mobility Alternatives

Mobility Guides

Available at no charge - email mard@ualberta.ca

Edmonton and Area

Calgary and Area
QUESTIONS?

For more information:
bdobbs@ualberta.ca
780-492-0374
www.mard.ualberta.ca

References

References


https://www150.statcan.gc.ca/n1/pub/11-008-x/2012001/article/11619-eng.htm


https://open.alberta.ca/publications/fatality-inquiry-2016-12-09#detailed


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