Predicting fitness-to-drive in elderly drivers with cognitive impairments

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Legislation in Belgium

Royal Decree: Driving License
Sworn Statement

Condition ruling out fitness to drive?
Return license within 4 days

Fitness to drive is questionable?
1. Examination by a doctor
2. Referral to CARA (Belgian Road Safety Institute)
The case of cognitive deterioration

**RD Appendix 6, Section II, 1.1.6**

The candidate with a physical, mental or cognitive disorder (either congenital, acquired or as a result of the aging process) resulting in significantly deviant behavior, adaptation, judgement or perceptual skills or deviant psychomotor reactions is not fit to drive.

**RD Appendix 6, Section I, 3**

Fitness to drive is determined after a medical examination in which all available methods within the medical practice can be used.
Current Referrals

65+ Candidates @ CARA:
92% Pass [1]

Multidisciplinary Evaluation

- On-Road test
- Extensive Testing & Driving Simulator
- Basic Functional Test
- Checklist

Which functional abilities can predict driving abilities in elderly drivers with cognitive decline?

Develop a set of maximum 5 functional tests that can be used in the doctors office to assess driving in the elderly.
Step 1

Tests of Functional Abilities

- Visual Tests
- Physical Tests
- Cognitive Tests
- Knowledge of Road Signs
Step 2

Driving Simulator Test

• Simulator data
  • Lateral position
  • Reaction time
  • Etc.

• Test Ride for Investigating Practical Fitness to Drive (TRIP)
On-road Evaluation

- Classic pass/fail evaluation
- Test Ride for Investigating
  Practical Fitness to Drive (TRIP)
Outcome measures

DRIVING

Fitness to Drive → Pass/ Fail Evaluation
Driving Abilities → Test Ride for Investigating Practical Fitness to Drive

## Results: Participants

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>78.6</td>
<td>5.4</td>
</tr>
<tr>
<td>Driving Experience</td>
<td>55.4</td>
<td>8.0</td>
</tr>
<tr>
<td>Mini Mental State Examination</td>
<td>26.9</td>
<td>2.4</td>
</tr>
</tbody>
</table>
Results: On road Test

75

Best Predictive Functional Tests

Auditory Verbal Learning Test
Visual Acuity – Snellen chart
Clock Drawing
Knowledge of Road Signs

41
Results: TRIP subscales

**Simulator**
- Visual behavior: 28%
- Merging into traffic: 27%
- Anticipation skills: 27%

**On-road**
- Visual behavior: 23%
- General insight: 18%
- Anticipation skills: 16%
How can we improve and maintain driving abilities in elderly drivers experiencing cognitive decline?

TRAINING
Future: Training

• Visual behavior
• Anticipation skills

➢ Direct approach
➢ Indirect approach

Simulator training
Cognitive training?

Planned start: December 2015
Thank You!

Questions?

Comments?

Suggestions?