A pilot study into Fitness to Drive following stroke and brain injury

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Grensás Rehabilitation

- Inpatients (24 beds), outpatients (30 beds) and ambulatory service
- Patients: Stroke, traumatic/ non-traumatic brain injury, spinal cord injury, multitrauma, amputations, complex medical conditions and diverse neurological dysfunctions
- Patient age 18 – 75 yrs
- About 100 – 120 stroke and brain injury patients annually
- About 90 staff - neurology, rehabilitation medicine, nursing, physiotherapy, occupational therapy, psychology/ neuropsychology, speech therapy, social work
“No uniform guidelines exist in Iceland for patients, the public nor physicians about what it means to be fit to drive” (2007).

“Specific rules need to be established for the evaluation of fitness to drive as research indicates that assessment systems currently used to evaluate driving ability are inadequate” (2007).
The Study

Objectives

1. Acquisition of the Expert System Traffic - XPS
2. Translation into Icelandic
3. A pilot study into its suitability for Icelandic stroke and brain injury patients

This is a preparatory study for a subsequent, larger interdisciplinary investigation at Grensás, into the predictive validity of the XPS
What has been happening so far ...

- Summer 2011: Grant applications for intended study
- November-December 2011: Four financial grants
- January 2012: Purchasing the Expert System Traffic – XPS (Schuhfried GmbH)
- February to May 2012: Translation
- June –September 2012: Research assistant / postgrad. student (University of Iceland), collaboration with University, supervision
- August 2012 - current: Testing
- End of March 2013: Analyses
- Education/ lectures – Icelandic Road Administration
The Expert System Traffic Test XPS (Schuhfried, 2005)

The XPS builds on empirically tested models of the correlation between cognitive, motor and personality dimensions of performance and attainment in a standardized driving test.

<table>
<thead>
<tr>
<th>Expert System Traffic Test - XPS</th>
<th>Rel.</th>
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<tbody>
<tr>
<td>Peripheral Perception Test</td>
<td>Divided attention in horizontal visual field</td>
</tr>
<tr>
<td>Cognitrone</td>
<td>Concentration</td>
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<tr>
<td>Determination Test</td>
<td>Stress tolerance</td>
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<tr>
<td>Reaction Test</td>
<td>Reaction time and motor speed</td>
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<tr>
<td>Adaptive Matrices Test</td>
<td>Logical reasoning</td>
</tr>
<tr>
<td>Adaptive Tachistoscopic Traffic Perception Test</td>
<td>Visual overview</td>
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<tr>
<td>Total duration</td>
<td>65-75 min.</td>
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Validity and reliability
Test reliabilities $r=0.70$ and $r=0.99$
Total validity coefficient $R=0.77$; sensitivity 86%, specificity 80%

Norms
Independent of age, gender or education

Interpretation
Percentile ranks

Economical advantage
Adequate performance saves cost for on-road driving assessment.
The XPS
is not intended
to replace on-road
driving assessment
Preliminary XPS Results

To date N=18

- age 26.1 – 78.9 yrs
- male n=8 female n=10
- stroke n=14 brain injury n=4

- 33.3%: “adequate driving ability”: no on-road driving test necessary
- 61.1%: on-road driving test necessary
Fit to Drive FtoD following stroke/brain injury
Clinical guidelines at Grensás – draft

- **team decision**: no further assessment
- **team decision**: Some doubt about FtoD but further assessment indicated
- **team decision**: Strong doubt about FtoD, no further assessments at this stage

- **XPS assessment of FtoD**
  - **pass**
  - **pass with some doubt**

- **reevaluation**: further assessments indicated
  - **pass**
  - **fail**

- **reevaluation**: no progress
  - **fail**

- **reevaluation**: no progress

- **onroad driving assessment**
  - **pass**
  - **fail**
  - **pass with some doubt**

- **„not fit to drive“**

- **„fit to drive with conditions“**

Quelle: Verband der TÜV e.V
Interdisciplinary research study 2013-2015

XPS – on-road driving assessment
• to contribute to the development of cost-effective guidelines of Fit to Drive in Iceland

Establishment of a Traffic Examination Centre in late 2013
• to offer assessment of Fitness to Drive and quality professional advice to the public

Traffic behaviour deficits driving under the influence, speeding...
• ongoing liaison with German psychologist experts (MPU AVUS)
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