The Future of Driving

FROM VOLVO

CNN

The Future of Driving
The Future of Driving

• Autonomous driving is not going to mean jump in the car, push a button, and say 'Take me to grandma's house' and go to sleep,'

James Bell, head of consumer affairs for GM

The Future of Driving

• Manufacturers, researchers, and governments must work to establish standards and laws
• Large amounts of information from an array of sensors, cameras and radar systems, to calculate risks and make split-second
• Cost, maintenance, and familiarity
The Future of Driving

• "Is the autonomous car taking over?

  “No: We make it very clear to the driver that you have to keep on driving. Automation is just a support function. ”

Filip Brabec, director of product management for Audi

Driving

• A complex activity that involves continuous accurate and timely interaction between visual, cognitive, and motor abilities

• More than 50% of individual with MS are driving

• Failure rates on driving evaluations is between 19% and 42%
Driving

- Current evaluation practices involves the use of many tests
- Lasts about 3 hours and costs >$500

Driving

- Identify the most important predictors of the driving evaluation outcome
- 44 drivers with relapsing-remitting MS, age = 46 ± 11 years, 84% females, and EDSS between 1 and 7
Driving

- 5 Tests explained 59% of the variance

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<th>UFOV</th>
<th>Stroop</th>
<th>SDSA - Dir</th>
<th>SDSA - Comp</th>
<th>SDSA - RS</th>
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### Predictive Analysis

<table>
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<tr>
<th>Road</th>
<th>Predicted</th>
<th>Fail</th>
<th>Pass</th>
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</thead>
<tbody>
<tr>
<td>Pass</td>
<td>3</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>Fail</td>
<td>7</td>
<td>1</td>
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- **Predictive accuracy = (7+33) / (7 + 1 + 3 + 33) = 91%**
- **Sensitivity = (7) / (7 + 3) = 70%**
- **Specificity = (33) / (1 + 33) = 97%**
Validation of the short battery

- 63 drivers with MS, age = 49 ± 9 years, 89% females, and EDSS between 3 and 7
- Off-road tests including the five tests were administered on one day
- Standardized road test was administered on another day by an expert

validation of the short battery

- Each of the five tests was significantly associated with outcome of the road test
- The five tests explained 44% of the variance
Validation of the short battery

- Valid predictor of fitness-to-drive of individuals with MS
  - Pass = recommend for practical road test to make final decision
  - Fail = More testing required before a final decision is made
- Lasts less than 1 hour and should cost >$150
- More accurate in predicting those who passed the road test
Validation of the short battery

- More individuals passed the road test
- May explain why the battery is better at predicting those who passed
- On-going study to recruit 180 participants
- Finding could have very significant clinical impact

Future activities

- Conducted a pilot study to determine the feasibility of the protocols of a larger randomized controlled intervention study
- Extending the on-going validation study to investigate the relationship between fall risk and driving performance
- Investigate the possibility of simultaneously reducing fall risk and improving driving performance
Acknowledgments

• The Consortium of Multiple Sclerosis Centers
• National Multiple Sclerosis Society
• Georgia Regents University, Augusta GA
• Y’all