A discriminating measure of variability in instrumental activities of daily living

Juleen Rodakowski, OTD, OTR/L, Elizabeth Skidmore, PhD, OTR/L, Margo Holm, PhD, OTR/L, Pamela Toto, PhD, OTR/L, Joan Rogers, PhD, OTR/L

School of Health and Rehabilitation Sciences
Department of Occupational Therapy

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Background
• Mild Cognitive Impairment (MCI)
  – Measurable changes in cognition
  – Absence of diagnosed dementia
  – Preservation of general independence in activities of daily living

(Peterson et al., 1999)

Categories of ADL

Functional Mobility
Self Care
Physical IADL
Cognitive IADL

(Holm & Rogers, 2008)

Mild Neurocognitive Disorder

Mild NCD: “capacity for independence”

(DSM-5, 2013)

Preclinical Disability

Patterns of limitations before they are clinically significant

(Fried et al., 1991)
Purpose

- To determine whether preclinical disability in performance of cognitive instrumental activities of daily living would discriminate between older adults with MCI and normal cognitive function.

Examining preclinical disability in MCI is important because...

- Improve understanding of disease progression
- Enhance diagnostic process

We really care because...

Can occupation-based interventions slow the trajectory of disability?

Study Design

- Older adults with remitted depression
  - 61 individuals with MCI
  - 96 individuals with normal cognition
- Cross-sectional data

Cognitive Status

- 17 Neuropsychological tests
  - 1 to 1.5 SD below mean
- No disability in basic ADL

Preclinical Disability

- Performance Assessment of Self-Care Skills (PASS)

<table>
<thead>
<tr>
<th>Cognitive-Instrumental Activities of Daily Living</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Shopping</td>
<td>Bill Paying</td>
</tr>
<tr>
<td>Checkbook Balancing</td>
<td>Bill Mailing</td>
</tr>
<tr>
<td>Telephone Use</td>
<td>Medication Management</td>
</tr>
<tr>
<td>Critical Information Retrieval</td>
<td>Small Device Repair</td>
</tr>
</tbody>
</table>

(Rogers, Holm, 1984)
Example from Pass

**Participant Characteristics**

<table>
<thead>
<tr>
<th></th>
<th>MCI</th>
<th>Normal cognitive function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years, M±SD</td>
<td>75.5±6.3</td>
<td>72.5±5.8</td>
</tr>
<tr>
<td>Race, % White, n (%)</td>
<td>45 (73.8)</td>
<td>89 (92.3)</td>
</tr>
<tr>
<td>Education in years, M±SD</td>
<td>12.9±2.3</td>
<td>14.1±2.5</td>
</tr>
<tr>
<td>Depressive symptoms, M±SD</td>
<td>4.0±3.4</td>
<td>5.0±3.2</td>
</tr>
<tr>
<td>Sex, % female, n (%)</td>
<td>48 (78.7)</td>
<td>87 (79.2)</td>
</tr>
<tr>
<td>Marital Status, % Married, n (%)</td>
<td>27 (44.3)</td>
<td>47 (49.0)</td>
</tr>
<tr>
<td>Employment, % Full time, n (%)</td>
<td>2 (3.3)</td>
<td>7 (7.3)</td>
</tr>
</tbody>
</table>

**Data Analysis**

- Analysis of covariance (ANCOVA)
- Receiver operating characteristic (ROC) curves

**Performance in Tasks**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number of cues</th>
<th>MCI</th>
<th>Normal cognitive function</th>
<th>ANCOVA F(df)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shopping</td>
<td>7.49±6.25</td>
<td>7.34±3.59</td>
<td>F(1,154)=8.23, p&lt;0.01</td>
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</tr>
<tr>
<td>Bill Paying</td>
<td>3.47±4.31</td>
<td>1.39±2.75</td>
<td>F(1,154)=7.52, p&lt;0.01</td>
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</tr>
<tr>
<td>Checkbook Balancing</td>
<td>1.86±6.81</td>
<td>2.29±3.85</td>
<td>F(1,154)=12.10, p&lt;0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medication Management</td>
<td>3.28±3.58</td>
<td>1.27±2.24</td>
<td>F(1,154)=7.10, p&lt;0.01</td>
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</tr>
<tr>
<td>Critical Information Retrieval</td>
<td>0.79±1.49</td>
<td>0.36±0.76</td>
<td>F(1,154)=4.51, p&lt;0.04</td>
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</tr>
<tr>
<td>Small Device Repair</td>
<td>1.89±3.31</td>
<td>0.43±1.04</td>
<td>F(1,154)=2.81, p&lt;0.05</td>
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<tr>
<td>Bill Mailing</td>
<td>3.66±3.96</td>
<td>1.92±2.25</td>
<td>F(1,154)=2.03, p&lt;0.10</td>
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<tr>
<td>Telephone Use</td>
<td>1.13±1.82</td>
<td>0.65±1.38</td>
<td>F(1,154)=1.45, p&lt;0.25</td>
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<tr>
<td>Composite of 8 Tasks</td>
<td>28.0±16.69</td>
<td>11.7±9.78</td>
<td>F(1,154)=44.40, p&lt;0.01</td>
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</table>

**ROC Curve of 8 Tasks**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Area Under the Curve</th>
</tr>
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<tbody>
<tr>
<td>8 Tasks</td>
<td>0.81</td>
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</tbody>
</table>

(Rodakowski et al., In Press)
Discussion

- PASS may be sensitive enough to detect preclinical disability
- Individuals with MCI demonstrate preclinical disability
  - Shopping
  - Checkbook Balancing

Limitations

- Secondary data analyses
- History of major depression

Future Directions

- Reproduce findings

Conclusions

- Understanding the relationship between cognitive decline and performance of cognitive-instrumental activities of daily living
  - Improve understanding of disease progression
  - Enhance diagnostic process

Conclusions

- First-line of defense
- Advocate for services

Contact Information

Juleen Rodakowski, OTD, OTR/L
University of Pittsburgh
School of Health and Rehabilitation Sciences
Department of Occupational Therapy
5012 Forbes Tower
Pittsburgh, PA 15260
jur17@pitt.edu