Focused Question

What is the evidence for the effectiveness of interventions to improve occupational performance for those with cognitive impairments after stroke?

Glen Gillen, Ed.D., OTR/L, FAOTA, Dawn M. Nilsen, Ed.D., OTL, Jessica Attridge, BS, Erasmia Banakos, BA, Marie Morgan, BA, Lauren Winterbottom, MM & Wesley York, BA

Guided Research Process

- Updating of: Occupational Therapy Practice Guidelines for Adults with Stroke
- AOTA Collaboration
  - Marian Arbesman, Ph.D., OTR/L
  - Deborah Lieberman, MHSA, OTR/L, FAOTA
- Focused on Level I – III studies published between 2003-2012

Guided Research Process

- 1,382 ABSTRACTS REVIEWED
- 95 ARTICLES REVIEWED
- 49 ARTICLES EXCLUDED
- 47 ARTICLES INCLUDED

Main Themes:
- General Cognition
- Executive Function
- Unilateral Neglect
- Visual Dysfunction
- Memory
- Apraxia
- Attention

Results of Search Process

<table>
<thead>
<tr>
<th>IMPAIRMENT AREAS</th>
<th>LEVELS OF EVIDENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td>General Cognition</td>
<td>3</td>
</tr>
<tr>
<td>Executive Function</td>
<td>1</td>
</tr>
<tr>
<td>Unilateral Neglect</td>
<td>13</td>
</tr>
<tr>
<td>Visual Dysfunction</td>
<td>6</td>
</tr>
<tr>
<td>Memory</td>
<td>3</td>
</tr>
<tr>
<td>Apraxia</td>
<td>3</td>
</tr>
<tr>
<td>Attention</td>
<td>1</td>
</tr>
</tbody>
</table>
Results: Types of Outcome

Measures: Activity/Participation

- Barthel Index
- FIM
- AMPS
- Frenchay Activities Index
- Reading
- Multiple Errands Test
- BIT
- SF-36
- Driving
- Catherine Bergego Scale
- Rankin Scale
- Lawton IADL
- Mobility (W/C, street crossing)

Results: Types of Outcome

Measures: Impairments

- Perimetry
- Neglect
- Clock drawing test
- NIH Stroke Scale
- Apraxia Test
- Digit Span
- California Verbal Learning
- MVPT
- LOTCA
- MMSE
- Trail Making
- Stroop Test
- Rey Auditory Verbal Learning
- Etc.

Preliminary Results: General Cognition

Level I
- Insufficient evidence to either support or refute the use of cognitive-perceptual interventions (sensory stimulation, workbooks) to improve ADL function.

Level III
- Limited evidence for home rehabilitation consisting of remediation therapy, story retelling, cognitive enhancing games, and aerobic exercise was beneficial for IADL.

Preliminary Results: Executive Functioning

Limited evidence that a variety of interventions are effective:

Level I
- Time Pressure Management Strategies improve speed in daily task performance in those with mental slowness.

Level III
- VMall: Improvements in both the virtual and hospital versions of the Multiple Errands Test.
- Recreation and leisure program: improved walking and talking ability and neuropsychological measures.
Maybe bullet some examples? I didn't mention all for motor just provided some examples for each category - what do you think? May allow you to combine the two slides

Dawn Nilsen, 3/26/2013
### Preliminary Results: Attention Deficits

**Insufficient:**

- **Level I**
  - Attention Process Training: Improvement on neuropsychological measure of attention. No difference on QOL, Rankin scale, general health, Cognitive Failures Questionnaire.

### Preliminary Results: Memory

**Limited:**

- **Level III**
  - Ecologically-oriented, strategy-based intervention (WOPR): Improvements on some everyday memory simulations consisting of declarative memory tasks and one prospective memory task.

**Insufficient:**

- **Level I**
  - Computerized Memory Training: improvements in self-rated cognitive function (CFQ) and neuropsychological measures. No change on simulated ADL.
  - Mnemonic strategies: no significant effects on outcomes. No evidence to support or refute the effectiveness on functional outcomes.

### Preliminary Results: Apraxia

**Level I**

- Moderate:
  - Cognitive Strategy Training (teaching internal/external compensatory approaches to execute ADL): significant improvement in ADL and documented generalization to non-trained tasks.
  - Limited
  - Gesture Training: significant improvement on ADL questionnaire and tests of apraxia.

### Preliminary Results: Unilateral Neglect

**Level II**

- VST vs. OKS: OKS group improved on reading (decreased word omissions) and other measures of neglect as compared to VST.
  - VST vs. Virtual Reality (VR): Both groups improved on ADL, improved virtual street crossing for VR, no difference in actual street crossing.

**Level I**

- Visual Scanning Training (VST) (moderate evidence)
  - Combination of VST and optokinetic stimulation (OKS) and VST alone groups showed improvements in function as well as measures of neglect. No additive effect from stimulation.
  - VST is equally effective as compared to arm activation (AA) for FIM, BIT, and CBS (AA group maintained at 6 months).
  - No additive effect of e-stim during VST on ADL.

**Level I**

- Prisms/Prism Adaptation (PA) (mixed evidence)
  - Two PA studies found no difference when compared to sham treatment on Catherine Bergego Scale and/or BIT. One study documented that those with mild neglect demonstrated a significant difference in the change of the BIT-C and FIM compared to sham. This was not true for severe neglect.
Preliminary Results: Unilateral Neglect

- Prisms and Prism Adaptation (PA)
  Level II
- Prisms during ADL vs. PA: No difference on cancellation, FIM, CBS, NIH stroke scale.
- /- PA and reading: Conflicting evidence based on 2 studies.
- PA and w/c mobility: improved accuracy during propulsion.
- PA and ADL: improvements on BIT and reading ability.
  Level III
- Long term improved BI, COG, eye movements and cancellation/bisection tests.

Preliminary Results: Visual Field Deficit

Scanning Training: Mixed evidence:

- Level I
  Compensatory scanning/exploratory saccade training: subjective improvements in mastering daily-life activities, ADL questionnaire, and mixed findings regarding reading speed.
- Level II
  Systematic treatment program consisting of education, scanning training, coordinating head and eye movement, and tracking activities: significant improvement in the Nottingham Adjustment Scale, no difference on the BI or BIT.
- Level III
  Perimetry training: improved reading speed for 4/7 subjects.

Preliminary Results: Visual Field Deficits (cont.)

Insufficient

- Level I
  Dynavision 2000: no significant improvement in driving, response time, or scanning ability.
  Computer based compensatory training: improved reading, BI, attention, visual search, cancellation. Comparable to traditional OT.

Limitations of Review

- Small sample sizes
- Inconsistent use of performance measures
- Simulation vs. actual observation of ADL
- Heterogeneous groups
- Long term effects not as well studied
- Limited the search to journals published in English
- Possibility of missing studies because of combinations of search terms

Implications for Practice/Education

- Evidence suggests there are emerging interventions that are effective at improving occupational performance for those with cognitive impairments after stroke
- Intervention Commonalities:
  - Performance focused.
  - Strategy training
  - Compensatory

Implications for Research

- Overall requires more attention in terms of volume and quality.
- Areas other than neglect also require increased focus (ex. attention, executive functions, etc.).
- Focus on inclusion of activity, participation, and quality of life, measures.