Focused Question

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

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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

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

Guided Research Process

- 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>
<th>TOTAL</th>
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<tr>
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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)

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.
- Moderate evidence for the effectiveness of language and visuospatial training for aphasia and neglect syndromes after stroke.

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 I**
  - **Moderate:**
    - Visual Scanning Training (VST) (moderate evidence)
  - **Limited**
    - 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.

### 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**
  - 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 with 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/explorative 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.