Preliminary Findings From the Systematic Review on Occupational Therapy Interventions for Stroke

Focused question: What is the evidence for the effectiveness of interventions to improve occupational performance for those with motor impairments after stroke?

Note. Data presented in the slides are preliminary and may differ from that in the final evidence review.
Focused Question

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


Guided Research Process

- Updating of: Occupational Therapy Practice Guidelines for Adults with Stroke (Sabari, 2008)
- 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

- Main Themes:
  - Task Oriented Training Using Objects in Natural Environments
  - Task Oriented Training Combined with Cognitive Strategies
  - Task Oriented Training Facilitated by Devices or Combined with Accessory Interventions
  - Adjunctive Interventions

Interventions: TOT Using Objects in Natural Environments

Interventions: TOT Combined with Cognitive Strategies
### Interventions: TOT Facilitated by Devices or Combined with Accessory Interventions

<table>
<thead>
<tr>
<th>INTERVENTION</th>
<th>LEVELS OF EVIDENCE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repetitive Task Practice (RTP)</td>
<td>I 15 II 5 III NA</td>
<td>20</td>
</tr>
<tr>
<td>Constraint Induced Movement Therapy (CIMT/mCIMT)</td>
<td>I 16 II 4 III NA</td>
<td>20</td>
</tr>
<tr>
<td>Bilateral Training (excluding BATRAC)</td>
<td>I 3 II 0 III NA</td>
<td>3</td>
</tr>
</tbody>
</table>

### Interventions: Adjunctive

<table>
<thead>
<tr>
<th>INTERVENTION</th>
<th>LEVELS OF EVIDENCE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental Practice</td>
<td>I 9 II 0 III NA</td>
<td>9</td>
</tr>
<tr>
<td>Virtual Reality</td>
<td>I 4 II 1 III NA</td>
<td>5</td>
</tr>
<tr>
<td>Mirror Therapy</td>
<td>I 3 II 0 III NA</td>
<td>3</td>
</tr>
<tr>
<td>Action Observation</td>
<td>I 2 II 0 III NA</td>
<td>2</td>
</tr>
</tbody>
</table>

### Results of Search Process

#### TOT Using Objects in Natural Environments

<table>
<thead>
<tr>
<th>INTERVENTION</th>
<th>LEVELS OF EVIDENCE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Stimulation</td>
<td>I 23 II 0 III NA</td>
<td>23</td>
</tr>
<tr>
<td>Robotics</td>
<td>I 11 II 1 III 13</td>
<td>13</td>
</tr>
<tr>
<td>Botox</td>
<td>I 4 II 2 III 6</td>
<td>6</td>
</tr>
<tr>
<td>Brain Stimulation</td>
<td>I 5 II 0 III 5</td>
<td>5</td>
</tr>
<tr>
<td>BATRAC</td>
<td>I 3 II 0 III 3</td>
<td>3</td>
</tr>
</tbody>
</table>
Results: Types of Outcome Measures

- **UE Function:**
  - Action Research Arm Test
  - Wolf Motor Function Test
  - Motor Activity Log

- **Balance/Mobility:**
  - Berg Balance Scale
  - 10 Minute Walk Test
  - Timed-Up-Go Test

- **Activity/Participation:**
  - Functional Independence Measure
  - Barthe Index
  - Stroke Impact Scale

Preliminary Results: TOT Using Objects in Natural Environments

- **Constraint Induced Movement Therapy:** (Strong Evidence)

<table>
<thead>
<tr>
<th>Level of Analysis</th>
<th>Significant Effects</th>
<th>Non-Significant Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>UE Function</td>
<td>16 Level 1 studies</td>
<td>3 Level II studies NA</td>
</tr>
<tr>
<td>Activity/Participation</td>
<td>4 Level 1 studies</td>
<td>1 Level I study</td>
</tr>
</tbody>
</table>

- **Bilateral Training**: (excluding BATRAC) (Limited Evidence)

<table>
<thead>
<tr>
<th>Level of Analysis</th>
<th>Significant Effects</th>
<th>Non-Significant Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>UE Function</td>
<td>1 Level I study</td>
<td>2 Level II studies NA</td>
</tr>
<tr>
<td>Activity/Participation</td>
<td>NA</td>
<td>1 Level I study</td>
</tr>
</tbody>
</table>

Preliminary Results: TOT Combined with Cognitive Strategies

- **Mental Practice:** (Mixed Evidence)

<table>
<thead>
<tr>
<th>Level of Analysis</th>
<th>Significant Effects</th>
<th>Non-Significant Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>UE Function</td>
<td>3 Level I studies</td>
<td>3 Level II studies NA</td>
</tr>
<tr>
<td>Activity/Participation</td>
<td>3 Level I studies</td>
<td>3 Level II studies NA</td>
</tr>
</tbody>
</table>

- **Virtual Reality:** (Moderate Evidence)

<table>
<thead>
<tr>
<th>Level of Analysis</th>
<th>Significant Effects</th>
<th>Non-Significant Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>UE Function</td>
<td>3 Level I studies</td>
<td>1 Level I study</td>
</tr>
<tr>
<td>Activity/Participation</td>
<td>1 Level I study</td>
<td>1 Level I study</td>
</tr>
</tbody>
</table>

Preliminary Results: TOT Combined with Accessory

- **Electrical Stimulation:** (Moderate Evidence)

<table>
<thead>
<tr>
<th>Level of Analysis</th>
<th>Significant Effects</th>
<th>Non-Significant Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>UE Function</td>
<td>15 Level I studies</td>
<td>8 Level II studies NA</td>
</tr>
<tr>
<td>Activity/Participation</td>
<td>1 Level I study</td>
<td>2 Level II studies NA</td>
</tr>
</tbody>
</table>

- **Robotics:** (Limited Evidence)

<table>
<thead>
<tr>
<th>Level of Analysis</th>
<th>Significant Effects</th>
<th>Non-Significant Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>UE Function</td>
<td>1 Level I studies</td>
<td>5 Level II studies NA</td>
</tr>
<tr>
<td>Activity/Participation</td>
<td>4 Level I studies</td>
<td>6 Level II studies NA</td>
</tr>
</tbody>
</table>
Preliminary Results: TOT Facilitated by Devices or Combined with Accessory Interventions

- **Botox**: (Mixed Evidence)
  - Level of Analysis
    - UE Function: 2 Level I studies, 1 Level II study, 1 Level I study
    - Activity/Participation: 1 Level I study, 2 Level I studies

- **Brain Stimulation**: (Mixed Evidence)
  - Level of Analysis
    - UE Function: 3 Level I studies, 1 Level I study, 1 Level I study
    - Activity/Participation: NA, 2 Level I studies

Preliminary Results: Adjunctive Interventions

- **Strengthening/Exercise**: (Strong Evidence)
  - Level of Analysis
    - UE Function: 4 Level I studies, 1 Level I study
    - Balance/Mobility: 7 Level I studies, 1 Level II study, 4 Level I studies
    - Activity/Participation: 9 Level I studies, 1 Level I study

- **Positioning Devices/Orthotics**: (Limited Evidence)
  - Level of Analysis
    - UE Function: NA, 4 Level I studies
    - Balance/Mobility: 1 Level I study, 1 Level II study, NA
    - Activity/Participation: NA, 3 Level I studies

Limitations of Review

- Heterogeneity of studies within intervention categories:
  - Participant characteristics
  - Intervention protocols
  - Outcome measures
- Many studies with small sample sizes
- Possible duplication of studies across intervention categories (e.g., RTP & CIMT; BT/BATRAC & E-Stim)
- Limited the search to journals published in English
- Possibility of missing studies because of combinations of search terms

Future Directions of the Review

- Where do we go from here?
  - Consideration is being given to the following:
    - Rating the methodological quality of the individual studies included in the review (e.g., PEDro Scale)
    - Pooling data related to specific outcomes (e.g., UE function; Activity) to determine overall effect sizes
    - Alternative methods to systematically grade the strength of the evidence (e.g., GRADE)
D9 tentative counts - still need to cross reference
Dawn, 3/22/2013
Evidence suggests there are multiple interventions that are effective at improving occupational performance for those with motor impairments after stroke.

**Intervention Commonalities:**
- Goal oriented activities (i.e. OCCUPATION!)
- Provide just the “right” amount of challenge
- Repetition without repetition (i.e. VARIABILITY)
- Use it to improve it:
  - PRACTICE!
  - PRACTICE!!
  - PRACTICE!!!

**Implications for Practice/Education**

**Implications for Research**

- Which interventions should be used with which stroke survivors?
  - Time post-stroke (e.g., acute vs chronic)
  - Motor impairment level (e.g., severe vs mild)
  - Lesion location
- Dosing: how much is enough?
- Long term effects needs to be evaluated
- Cost efficiency: how much does it cost to integrate the intervention into clinical practice?
- Underlying mechanisms of the treatment effects

**Thank You!**