Slide Presentation
93rd AOTA Annual Conference & Expo, April 2013, San Diego, CA

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

Focused question: What is the evidence for the effectiveness of activity/occupation-based interventions to improve areas of occupation and social participation after stroke?

Note. Data presented in the slides are preliminary and may differ from that in the final evidence review.
Occupation-Based Interventions in Stroke Rehabilitation

Timothy J. Wolf, OTD, MSCI, OTR/L
Adrianna Chuh, MSOT/S
Karen McInnis, MSOT/S
Elizabeth Williams, MSOT/S
Washington University in St. Louis
School of Medicine
Program in Occupational Therapy

Focused Question

• What is the evidence for the effectiveness of activity/occupation-based interventions to improve areas of occupation and social participation after stroke?
  • The use of occupation-based interventions is central to the practice of occupational therapy
  • Included
    • Peer-reviewed literature and consolidated information sources such as Cochrane
    • Published after 2002
    • English
    • Level I, II, and III
    • Level IV or V if no literature is available at higher levels
    • Within the scope of occupational therapy practice
    • Within the scope of the focused question

Process

• Citations reviewed by students and faculty member
  • 83 Abstracts reviewed by the team
    • Team met to discuss all abstracts to make a final decision on their inclusion
  • 78 Full manuscripts reviewed by the team
    • Two members of the team reviewed each manuscript
    • Discussed all manuscripts as a group to determine eligibility for inclusion in this review
    • Final selection reviewed by AOTA representatives
    • Final number of studies included: 39

Studies Included

<table>
<thead>
<tr>
<th>Level of Evidence</th>
<th>Study Design/Methodology of Selected Articles</th>
<th>Number of Articles Selected</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Systematic reviews, meta-analysis, randomized controlled trials</td>
<td>26</td>
</tr>
<tr>
<td>II</td>
<td>Two groups, nonrandomized studies (e.g., cohort, case-control, non-randomized controlled trials)</td>
<td>4</td>
</tr>
<tr>
<td>III</td>
<td>One group, nonrandomized (e.g., before and after, protocol and protocol)</td>
<td>1</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>39</td>
</tr>
</tbody>
</table>

Summary of Findings

• The findings from this review are clustered into five areas of occupation from the Occupational Therapy Practice Framework (AOTA, 2008):
  • Activities of daily living (ADL)
  • Instrumental activities of daily living (IADL)
  • Leisure
  • Social participation
  • Rest and sleep
• Within each area, studies are further classified by area of practice
  • Inpatient
  • Outpatient
  • Home
  • Community

ADL

• Ten Level I randomized controlled trials (RCT), five Level I systematic reviews, two Level II non randomized controlled studies, and four Level III studies
• Interventions included but were not limited to: education programs, yoga, virtual reality, adaptive equipment training, cognitive strategy training, and ADL/function-based interventions.
Limited evidence from one Level I systematic review to support the use of functional (task training) over remedial (not activity-based) (Haslam & Beadle, 2007)

Insufficient evidence from one Level I RCT to support the effect of coupling occupational therapy intervention (ADL training with family involvement) with “conventional treatment model (CTM)” (medical intervention with possible physical therapy) compared to CTM alone (Abizanda et al., 2011)

Moderate evidence from one Level II study and one Level III study supports the effect of occupation based rehabilitation programs in a sub-acute setting to improve occupational performance

- “FIT” rehabilitation program (high intensity/dose OT and PT) (Sonoda et al. 2004)
- “slow stream” (more severe stroke, longer length of stay) stroke facility in England (Teasell et al., 2005)

No significant difference between errorless learning versus trial and error learning to teach ADLs to individuals with and without memory impairments after stroke (Mount et al., 2007)

- No significant differences between an occupation-based group program and standard care (individual therapy) on self-efficacy and well-being after discharge from an inpatient rehabilitation setting (Gustafsson & McKenzie, 2019)

Strong evidence from three Level I systematic reviews and two Level I RCTs to support the effect of home-based interventions on ADL performance in adults with stroke

- Home based assistive technology (AT) training compared to standard AT training: both groups had improved FIM scores after the interventions, but the home-based group showed higher rates of use of AT compared to the control group (Chieu & Mars, 2004)
- Self-care education program improved ADL performance compared to standard care group (Sahebalzamani et al., 2009)
- Three Level I systematic reviews found that ADL specific home-based interventions are associated with higher levels of independence in ADLs and decreased odds of death or poor outcomes (Legg, Drummond & Langhorne, 2009; Legg et al., 2007; and Legg & Langhorne, 2004)
- Insufficient evidence exists from one Level I RCT to support the effect of a home-based extended stroke unit service (ESUS) with early supported discharge compared to standard care (Askim, Rohweder, Lynderson & Indredavik, 2004)

Insufficient evidence from one Level II and one Level III study to support the effect of occupation based interventions in the sub-acute setting to improve occupational performance

- Limited evidence from one Level II systematic review to support the effect of home based assistive technology (AT) training compared to standard AT training:
- No significant difference between virtual reality and computer based scanning group on an ADL checklist (Katz et al., 2005)
- No differences between virtual reality and computer based scanning group on an ADL checklist (Katz et al., 2005)
- No differences between yoga and control group on quality of life rating or Modified Rankin Scale score (Schmid et al., 2012)

Insufficient evidence exists from four Level I RCTs to support the use of specific activity-based interventions to improve occupational performance

- No differences between a client-centered self-care intervention (CCSD) based on the Cognitive Orientation to Daily Occupational Performance (COPP) strategy model and standard self-care training on ADL performance (Guidetti et al., 2010; Guidetti & Ytterberg, 2011)
- No difference between virtual reality and computer based scanning group on an ADL checklist (Katz et al., 2005)
- No differences between yoga and control group on quality of life rating or Modified Rankin Scale score (Schmid et al., 2012)

Limited evidence from one Level II study and one Level III study to support the effect of activity/occupation-based interventions to improve ADL performance in an outpatient setting

- Significant improvements in functional independence from admission to discharge from a day hospital rehab program (Harshkovit et al., 2004)
- Significant difference in therapy services provided in day rehab versus an outpatient program (Boile, Heinevink, Zahra & Lavel, 2007)

Strong evidence from one Level I systematic review to support the use of functional (task training) over remedial (not activity-based) (Haslam & Beadle, 2007)

Insufficient evidence from one Level I RCT to support the effect of occupation based interventions on ADL performance in adults with stroke

- Significant improvements in functional independence from admission to discharge from a day hospital rehab program (Harshkovit et al., 2004)
- Significant difference in therapy services provided in day rehab versus an outpatient program (Boile, Heinevink, Zahra & Lavel, 2007)

Insufficient evidence exists from one Level I RCT to support the effect of occupation based interventions on ADL performance in adults with stroke

- Significant improvements in functional independence from admission to discharge from a day hospital rehab program (Harshkovit et al., 2004)
- Significant difference in therapy services provided in day rehab versus an outpatient program (Boile, Heinevink, Zahra & Lavel, 2007)

Insufficient evidence from one Level I RCT to support the effect of occupation based interventions on ADL performance in adults with stroke

- Significant improvements in functional independence from admission to discharge from a day hospital rehab program (Harshkovit et al., 2004)
- Significant difference in therapy services provided in day rehab versus an outpatient program (Boile, Heinevink, Zahra & Lavel, 2007)

Strong evidence from three Level I systematic reviews and two Level I RCTs to support the effect of home-based interventions on ADL performance in adults with stroke

- Home based assistive technology (AT) training compared to standard AT training: both groups had improved FIM scores after the interventions, but the home-based group showed higher rates of use of AT compared to the control group (Chieu & Mars, 2004)
- Self-care education program improved ADL performance compared to standard care group (Sahebalzamani et al., 2009)
- Three Level I systematic reviews found that ADL specific home-based interventions are associated with higher levels of independence in ADLs and decreased odds of death or poor outcomes (Legg, Drummond & Langhorne, 2009; Legg et al., 2007; and Legg & Langhorne, 2004)
- Insufficient evidence exists from one Level I RCT to support the effect of a home-based extended stroke unit service (ESUS) with early supported discharge compared to standard care (Askim, Rohweder, Lynderson & Indredavik, 2004)

- No significant differences between virtual reality and computer based scanning group on an ADL checklist (Katz et al., 2005)
- No differences between virtual reality and computer based scanning group on an ADL checklist (Katz et al., 2005)
- No differences between yoga and control group on quality of life rating or Modified Rankin Scale score (Schmid et al., 2012)

Insufficient evidence exists from four Level I RCTs to support the use of specific activity-based interventions to improve occupational performance

- No differences between a client-centered self-care intervention (CCSD) based on the Cognitive Orientation to Daily Occupational Performance (COPP) strategy model and standard self-care training on ADL performance (Guidetti et al., 2010; Guidetti & Ytterberg, 2011)
- No difference between virtual reality and computer based scanning group on an ADL checklist (Katz et al., 2005)
- No differences between yoga and control group on quality of life rating or Modified Rankin Scale score (Schmid et al., 2012)
### IADL-Inpatient

- Level I: Moderate evidence to support the use of virtual reality task simulation over recreational therapy to improve upper extremity motor function (Saposnik et al, 2010)
- Level I: Moderate evidence for a rehabilitation program targeting sexual functioning (Song et al, 2011)
- Level III: Limited evidence for the use of virtual reality to improve various skills deemed essential for safe street crossing (Kim et al, 2007)
- Level III: Limited evidence for the use of the Wheelchair Skills Program to teach powered wheelchair skills (Mountain et al, 2010)
- Level III: Insufficient evidence for a hospital-based virtual reality platform to improve executive functioning and multitasking within shopping tasks (Rand et al, 2009)
- Level I: Moderate evidence for driving simulation training over cognitive training (Devos et al, 2010)

### IADL-Outpatient

- Level I: Moderate evidence for an OT intervention exposing participants to mobility aides and general community mobility education over the provision of leaflets of information concerning local mobility services (Logan et al, 2004)
- Level III: Insufficient evidence for a VR rehabilitation (a computer based program with a joystick to control movement) training to increase community mobility (Yip et al, 2009)

### IADL-Community

- Limited to moderate evidence to support community-based interventions to improve occupational performance
  - Level I: Systematic review found limited evidence for activity/occupation based interventions that addressed depressive symptoms, and decreased participation/quality of life post stroke (Greven et al, 2011)
  - Level III: Limited evidence to support using a community rehab program over no participation in any ongoing rehab program (Hartman-Maier et al, 2007)
  - Level III: Limited evidence to support the use of a powered wheelchair or scooter over not using a device at all (Pettersson et al, 2006)
  - Level III: Limited evidence for a driver’s education program combining classroom instruction and on-the-road training to improve driving performance following a failed government driver’s test (Soderstrom et al, 2006)

### Leisure

- Two Level I RCTs showed limited to moderate evidence for activity/occupation-based interventions to increase participation in leisure occupations
  - Limited evidence for a day service rehabilitation program (incorporating voluntary leisure activities, outings, and skills training) to improve ADL/IADL performance (Corr et al, 2004)
  - Moderate evidence for a home-based leisure program in Canada to increase both self-reported participation in and satisfaction with leisure pursuits (Desrosiers et al, 2007)

### Social Participation

- Three Level I studies explored activity/occupation based interventions to increase social participation following stroke
  - Insufficient evidence for an individualized, occupation-based intervention in improving occupational performance (Egan et al, 2007)
  - Limited evidence for the Chronic Disease Self-Management Program to improve occupational performance (Kendall et al, 2007)
  - Moderate evidence for the Cognitive Orientation to daily Occupational Performance (CO-OP) intervention in supporting occupational performance goals compared to standard OT (Polatajko et al, 2012)

### Rest and Sleep

- Insufficient evidence from one Level I RCT by Taylor-Piliae & Coull (2011)
  - No significant improvement in sleep quality following participation in a Tai Chi program, compared to exposure to information about community-based exercise opportunities.
### Implications for OT

- Overall, the evidence indicates that activity/occupation based interventions improve occupational performance and participation following stroke
  - Most evidence related to ADL
  - Evidence related to IADL at times conflicting
  - Very little research that looks at other areas of occupation

### Limitations of Studies Appraised

- Very small samples
- Difficult to determine the effect of the activity/occupation-based component of the intervention
- Several of the review articles included multiple different interventions in their inclusion criteria that influenced their reported findings
- Several studies did not include an adequate control group
- Outcome measures employed that may not have been sensitive enough to detect the effect of the intervention
- Almost all the studies, with the exception of the studies that looked at ADL, used different outcome measures

### Thank you

Timothy J. Wolf, OTO, MSCI, OTR/L
Assistant Professor
Washington University in St. Louis
Program in Occupational Therapy
Campus Box 8505
4444 Forest Park Avenue
St. Louis, MO 63108
(314) 286-1683
wolff@wustl.edu

---

The American Journal of Occupational Therapy, January/February 2015, Volume 69, Number 1