Clinical Applications of Using Telerehabilitation: Wheeled Mobility and Seating

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Introduction

- Wheelchair viewed as one of the most important AT devices
  (Kirby et al., 2002)
- ~ 6M Americans have mobility impairments
  (Iezzoni, 2003; Iezzoni, McCarthy, Davis & Siebens, 2001)
- ~ 3.3M people 15 years of age and older use a wheelchair or similar device
  - 1.8M were 65 years and older (a little bit more than 5% of elderly population)

Rural Areas

- 25% of US population live in rural areas
- 22% of US population are senior citizens
  (Office of Management & Budget, 2004)
- < 10% who need a wheelchair have access to one
  (New Freedom Initiative, 2001)
Mobility Devices

Challenges

Wheelchair prescription = intrinsically complex intervention

• 3 variables:
  – Wheelchair user, needs, abilities, and preferences;
  – Available technology; and
  – Demands of the environment

• Reasons for unsuccessful wheelchair prescription outcomes:
  – Lack of active involvement by user
  – Lack of training in professionals
  – Disparities in disability and socioeconomic provisions
  – Poor device performance and unsatisfactory features with poor fit
Telerehabilitation as an Answer

• Steps taken:
  – Identify and analyze requirements of wheelchair prescription service
  – Design TR based on those requirements
  – Develop components into a cohesive infrastructure
  – Deploy the infrastructure
  – Conduct clinical effectiveness

Service Delivery Process
“Good Clinical Practice”

• Intake/Interview
• Physical Motor Assessment
• Mobility Related ADLs
• Outcomes
• Goals
• Clinical Trials
• Home Assessment
• Final Specifications
• Documentation
• Funding Approval
• Fitting & Delivery
• Follow-up / Outcome
TR Service Delivery Model for Remote Wheelchair Prescription
(Schein, Schmeler, Brienza, Saptono, & Parmanto, 2008)

Initial Data Collection

Initial Documentation and Report

Finalize Documentation

System Fitting and Delivery

Interaction Flow of Phases with Personnel
Deploy Infrastructure

- (a) Client's Service Documents and Tools
- (b) Online Collaboration Tools, such as Workflow Tracking and Service Issues Tracking
- (c) Multi-disciplinary service team, including clinicians, physicians, AT device suppliers, and caregivers
- (d) RERC on Telerehabilitation
Each of the remote clinics were at least 125 miles away from CAT-UPMC.

Example of Hospital Settings
Clinical Outcomes

- Reliability of a functional capacity tool
- Effectiveness of the new device
- Patient Satisfaction
- “Equivalence”
Patient Satisfaction

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean(SD)</th>
<th>P</th>
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</thead>
<tbody>
<tr>
<td>I was comfortable being evaluated through this means?</td>
<td>5.88(0.33)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>The results would be as accurate as being evaluated in-person?</td>
<td>5.64(0.49)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>All areas of your lifestyle were considered?</td>
<td>5.93(0.26)</td>
<td>&lt; 0.001</td>
</tr>
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<td>The technology did not interfere with the assessment</td>
<td>5.55(0.50)</td>
<td>&lt; 0.001</td>
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<td>The quality and clarity of the video and audio was acceptable?</td>
<td>5.31(0.72)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Consulting with an expert via TR saved you monetary expenses?</td>
<td>5.52(0.55)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Would you be willing to use TR again?</td>
<td>5.93(0.26)</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>
Feedback from Questionnaire

- “Very thorough assessment.”
- “I would love to see this technology expanded into different healthcare areas.”
- “We were very pleased with the assessment and how knowledgeable everyone was.”
- “If it was up to me, I would do this for all of my healthcare needs instead of making arrangements to travel all over to see my doctors.”
- “They treated me and not my disability. My family and I were very comfortable.”
Telerehabilitation Impact

**Access, Quality, & Capacity** of Service Delivery
- quality of life within natural environment
- community re-integration
- meet the needs of individuals with mobility impairments
- services to rural areas
- geographical barriers
- decrease travel costs
- provide clinician & client education

Thank You

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