Home Modifications:
Evaluation and Treatment Planning

Susy Stark
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Home Modifications

- Adaptive equipment
  - Tub transfer bench, hand held shower head
- Architectural modification
  - Grab bars, railing for stairs
- Task modification
  - Sleep on the other side of the bed
- Personal assistance
  - Husband carries laundry basket upstairs
- Patient/caregiver education
  - Teach caregiver proper transfer techniques
- Referral to appropriate service
  - Home delivered meals

Evidence

<table>
<thead>
<tr>
<th>Author</th>
<th>Population</th>
<th>Method</th>
<th>Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gitlin, L. &amp; Corchran, M.</td>
<td>Caregivers of persons with dementia</td>
<td>Observation of caregiver interventions</td>
<td>Caregivers develop effective environmental solutions on their own and accept solutions more readily for bathing than incontinence</td>
</tr>
<tr>
<td>Rorer, W., O’Hagan, A. &amp; Gommerman, C.</td>
<td>Full community dwelling older adults</td>
<td>RCT n=147</td>
<td>Individuals who received assistance including grab bars on doors and other adaptations decreased their unmet and long-term existing home costs</td>
</tr>
<tr>
<td>Gatson, D. &amp; Barrett, J. (2007).</td>
<td>Older adults with disabilities</td>
<td>Mixed survey of people with disabilities</td>
<td>Home modifications make a positive impact on difficulty and dependence experienced by people with mobility impairments in conducting routine household tasks; impact varies as a function of level of disability</td>
</tr>
<tr>
<td>Gitlin, L., Hauck, W., Winter, L., &amp; Rovner, W. (2006)</td>
<td>Older adults (75 years) with functional difficulties</td>
<td>RCT n=319</td>
<td>Intervention participants exhibited a 1% rate of mortality, compared with a 10% rate for no-treatment control participants</td>
</tr>
</tbody>
</table>
Module 2: Foundations

• Client-centered approach
• Theory
• Motivational interviewing
• Task Analysis
• Compensatory Treatment Principles

Client-centered and the meaning of place

• "At every point in our life we are defined by a particular location and a particular time. This place is represented a product of where we have been and where we are going." (Rowles, 2008)
• "We have to be especially sensitive to individual people’s way of being in place and do all we can to create communities that are sensitive and responsive to this need." (Rowles, 2008)
### Ecological Frame of Reference for Occupational Therapy (Stark, 2011)

<table>
<thead>
<tr>
<th>Use of Human Behavior</th>
<th>&quot;the good life&quot; (quality of life) is tied to the ability to maximize ability to perform desired activities in one's chosen environment. When the environment poses too great a challenge, there are negative consequences.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function/Dysfunction</td>
<td>Competence matches press in a functional person; occupational performance is maximized</td>
</tr>
<tr>
<td>Areas for evaluation</td>
<td>Personal Capacity, Environmental Press, Occupational Performance (outcome behavior)</td>
</tr>
<tr>
<td>Focus of task analysis</td>
<td>Context specific tasks that consider the physical (space, products, interface), and social aspects of the environment</td>
</tr>
</tbody>
</table>

### Ecological Frame of Reference

**Principles:**
- In order to maximize function, a match between competence and press should be achieved. This can be achieved by focusing intervention on capacity or environmental press.
- Individuals with lower competence are more vulnerable to the demands of the environment.
- Modification of press is the only option if capacity is not likely to change.
- There are generally multiple ways to change the press; individual appraisal of the choices will influence the outcome (the objective AND subjective press are important to measure).
- The therapist should test the person-environment fit continually and adjust to find the zone of maximum comfort/performance potential.
- Clients should participate in determining the best fit of person and environment.

### Therapeutic use of self: Motivational Interviewing

**What it is:** Directive, client centered therapeutic communication style that aims to help people explore and resolve their ambivalence about behavior change

**Why we use it:** Consistent with client centered practice & Theory

**When we use it:** to identify and explore potential modifications

**Outcomes:** enhanced adherence
Stages of Change Model

<table>
<thead>
<tr>
<th>Stage</th>
<th>Definition</th>
<th>Strategy</th>
</tr>
</thead>
</table>
| PRE-CONTEMPLATION   | Not considering possibility of change. Does not feel there is a problem. | Goal: raise awareness of problem.  
Task: inform and encourage, increase knowledge of risks. Validate lack of readiness. |
| CONTEMPLATION       | Thinking about change, in the near future. | Goal: build motivation and confidence.  
Task: explore ambivalence. Evaluate pros and cons. |
| PREPARATION         | Making a plan to change, setting gradual goals. | Goal: negotiate a plan.  
Task: facilitate decision making. Determine course of action. |
| ACTION              | Implementation of specific action steps, behavioral changes. | Goal: implement the plan.  
Task: support self efficacy, assist in taking steps toward change. |
| MAINTENANCE         | Continuation of desirable actions, or repeating periodic recommended step(s). | Goal: Maintain change or new status quo.  
Task: Identify strategies to prevent relapse. |

Clinical skill: Task analysis

- Process of analyzing the dynamic relationship between individuals and their occupations (roles, tasks, and activities) and environments/performance contexts (Watson & Llorens, p.2)

Clinical skill: Task analysis

- Analyze each step of the task to determine abilities required to complete task
- Compare abilities required for the task with your client's abilities
- Make necessary adjustments to the task or environment for successful completion of task
- Used as a tool in evaluation and intervention
Part 1: Analysis

O - Identify and describe the occupation

P - Identify the demands of the activity/task

E - Consider the contextual issues
  - temporal
  - physical
  - social
  - cultural

Part 2 - Individuation

• Compare the typical demands of the occupation to the abilities of your client
  – To determine how to compensate (decrease demands of environment to match skills of the individual)

Compensatory home modification treatment

• Structural Modifications
  – Tub cut

• Adaptive Equipment
  – Reacher, up-lift cushion

• Task modification
  – Re-arrange dishes, sit in different chair

• Change the occupational goal
  – Husband does laundry, wife folds

• Personal Assistance
  – Formal or informal
Solution priority

Architectural modifications

Personal devices

Personal support

Module 3: Assessment

• Assessment
  – Overview
  – Occupational Performance
  – Personal capacities
  – Person-environment fit
  – Personal factors

Assessment Process

• Client centered
  • In the home
  • Standardized assessments
  • Performance-based
  • Focus on barrier’s influence on performance
Personal abilities: for task analysis

- Sensory (vision, audition, tactile, pressure)
- Cognition
- Psychological
- Motor (UE, gait, balance)
- Standardized assessments
- Consistent with population, theory, intervention strategy

Measures of Personal Ability

**Physical**
- Range of Motion and Strength
  - Group muscle tests and goniometry (Radomski & Tromble Latham, 2008)
- Mobility
  - Get up and Go (Mathias, Nayak, & Isaacs, 1986)

**Sensory**
- Vision
  - Lighthouse Near Acuity Vision test (Elam, 1997)
- Audition
  - Combination of high- and low-pitched sounds (Edwards, et al, 2006)

**Cognitive**
- Memory and attention
  - Short Blessed Memory Test (Katzman et al, 1983)
- Depression
  - Geriatric Depression Scale (Yesavage, et al, 1983)

Measures of Occupation

- ADL & IADL performance
- Leisure activities
- Roles of the individual
- Performance and Satisfaction with their occupations
- Ways to evaluate Occupation:
  - Client interview/observation
  - Family/caregiver report

Stark, Somerville, Washington University in St Louis, 2012
Measuring the Environment

- Observation of the environment begins when you enter the neighborhood
- Not an “audit” approach
- Observe the person completing daily activities in their home environment
- Identify reasons that the activity is difficult

In-Home Occupational Performance Evaluation (I-HOPE):
A measure of P/E fit

Purpose of the I-HOPE

- Identify performance issues in the home
  - Older adults under-report problems
  - Older adults were unable to use interview strategies to identify problems
- Identify the influence of environmental barriers on performance
  - Current measures are “audits” of environmental features
Target Population

- Adults and older adults
- Live independently in community
  - Apartment
  - Condo
  - Detached home
- No or mild cognitive impairment

I-HOPE Constructs

- Daily activity patterns
- Self assessment of daily activity performance
- Environmental press

I-HOPE subscale scores

1) Activity score: proportion of activities that are problematic
2) Subjective Performance Score: mean performance rating
3) Subjective Satisfaction Score: mean satisfaction rating
4) Total Barrier Severity Score: magnitude of environmental barrier influence on performance (sum or mean)
Administration of I-HOPE

- Conducted in the home of individual
- Conducted by trained rater/detailed scoring rules
- Administration time: avg 60 minutes
- The I-HOPE is a multi step assessment that includes
  - a card sort
  - interview/subjective ratings
  - performance based ratings

Step 1: Card Sort

**Pile Descriptors**

1. I do not do and do not want to do
2. I do now with no problem
3. I do now with difficulty
4. I do now but am worried about my ability in the future
5. I do not do but want to do
Steps 2 and 3: Prioritize and Rate Performance

- Prioritize problems from piles 3, 4 and 5
- Subjectively rate the problems
  - **Performance**: (1= unable to perform, 5=able to perform)
  - **Satisfaction**: (1= not satisfied with performance, 5= totally satisfied with performance)

Goal Attainment Scaling, Stolee, Zaza, Pedlar & Myers, 1999; Canadian Occupational Performance Measure, Law et al, 1994
Step 4: Name and rate barrier’s influence on performance

Barrier Rating scale
0 = independent
1 = stand-by assistance needed because of the barrier
2 = minimum assistance needed because of barrier
3 = moderate assistance needed because of barrier
4 = maximum assistance needed because of barrier
5 = no activity
* All scores determined with or without device.

Item out of reach range

<table>
<thead>
<tr>
<th>Item out of reach range</th>
<th>High shelves in kitchen to reach dishes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Clothes dryer too low to reach in to retrieve clothes</td>
</tr>
<tr>
<td>Lack of hand supports</td>
<td>No supports near toilet for transfers</td>
</tr>
<tr>
<td></td>
<td>No hand supports near shower for transfers</td>
</tr>
<tr>
<td></td>
<td>No arms on chair to push up from sit to stand</td>
</tr>
<tr>
<td>Objects difficult to manipulate</td>
<td>Small button size</td>
</tr>
<tr>
<td></td>
<td>Round doorknob</td>
</tr>
</tbody>
</table>
Step 4: Name and rate barrier’s influence on performance

Barrier rated as 5, person totally dependent on caregiver to enter the building
Solution changed rating to 1, person can independently enter the home.

Naming Barriers

- Ask yourself
  - “What is it about the environment that is causing this person to be unable or have difficulty with completing the desired activity?”

  Not a barrier: Chair
Is a barrier: Chair seat too low (soft, no arms, etc)

Barrier List
Step 4

<table>
<thead>
<tr>
<th>Measure</th>
<th>Definition</th>
<th>Metric</th>
<th>Data Source</th>
<th>Formula/Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of activity</td>
<td>proportion of activities that are problematic</td>
<td>Subjective</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance of activity</td>
<td>subjective performance of activity</td>
<td>Subjective</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfaction with performance</td>
<td>subjective satisfaction of ability to perform an activity</td>
<td>Subjective</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnitude of environmental barriers influence</td>
<td>magnitude of environmental barrier influence on performance</td>
<td>Observation of barrier influence</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I-HOPE subscale scores

1) Activity score: proportion of activities that are problematic
2) Subjective Performance Score: mean performance rating
3) Subjective Satisfaction Score: mean satisfaction rating
4) Barrier’s influence on performance: magnitude of environmental barrier influence on performance (sum or mean)
Psychometrics

<table>
<thead>
<tr>
<th>I-HOPE Scores</th>
<th>ICC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity Score</td>
<td>.99</td>
</tr>
<tr>
<td>Performance Score</td>
<td>.94</td>
</tr>
<tr>
<td>Satisfaction Score</td>
<td>1.00</td>
</tr>
<tr>
<td>Total Barrier Severity</td>
<td>.99</td>
</tr>
</tbody>
</table>


Psychometrics

- Internal consistency*
  - Cronbach’s Alpha, ranged from .76 to .96 for 4 subscales
- Convergent validity*
  - Performance scores positively correlated with FIM $r(75) = .54\ (p=.000); .48\ (p=.000)$.

Note. * n=80, Stark et al, 2004

Assessment of Personal/Environmental Factors

- What: A summary of personal and environmental factors which may affect the choice of home modification. Simple checklist format, with room for notes
- Purpose: Tool for therapists narrow the choices of home modification intervention strategies/ supports client-centeredness.
- How it is used: Therapists uses to form to identify client-relevant principles for choosing intervention.
P & E Factors
- Characteristics of the person or environment that may influence treatment decisions
  - Stage of disease
  - Type of home; whom they live with
- Not typically assessed formally
- Critical for treatment planning

Module 4: Treatment Planning
- Process
- ID candidate solutions
- Evidence

Treatment Planning
- Rapport Building
  - Interview to identify additional PE factors
  - Set the stage for identification of barriers and solutions (using MI techniques)
- Name the Problem
  - Validate the problem and ask participant to define the barriers
  - Define outcome (participant’s target)
- Identify Barriers and Solutions
  - Brainstorm potential solutions
Identify Candidate Solutions

• What products exist?
  • Use the internet, product catalogs

• Where are they available?
  • Readily available in a store
  • Reacher
  • Special order
  • Pull down shelves

• Who were they designed for?
  • To be used by general public
  • Automatic jar opener
  • Specifically for a person with a disability
  • Adaptive utensils

Pay Attention to Characteristics of Modifications

• Installation
  — Does it require a contractor

• Care required
  — Amount of upkeep/maintenance

• Features
  — Options of the product

• After Sales Support
  — Customer service

• Anticipated Life Span
  — Warranty?

• Are these pros or cons? Depends on each client.

Modification Characteristics

• Appearance
  — Medical vs. “Homey”

• Cost
  — How much can the client afford

• Availability
  — Readily available or special order

• Adaptability & Suitability
  — Can it be adapted easily to meet client’s specific needs

• Functionality/Usability
  — Can others use it as well

• Design Requirements
  — What kind of space does the modification need
Technical Data Meets Client’s Preferences

- Compare products in terms of how well they meet your client’s needs
- Client decisions are usually made based on Cost vs Function vs Aesthetics
- Which are the client’s priority?
  - How much can they afford (tub cut vs. tub transfer bench)
  - How will the modification look in their home (raised toilet seat vs. toilevator)
  - Will their family still be able to function (tub cut)
- Need to be client-centered!!
  - The story of the blue toilet…

Being Client-centered

- Two clients different life story, same functional difficulty
  - Margie
    - Widow
    - Few financial resources
    - Is not bothered by medical looking equipment
    - Difficulty getting on/off toilet
  - Billie
    - Lives with her husband
    - Concerned about the appearance of her home
    - Currently enrolled in research study paying for her modifications
    - Difficulty getting on/off toilet
- Possible solutions for both
  - Raised toilet seat ($65)
  - Toilevator ($190)
  - New “comfort height” toilet ($300)
- Each one chose a different solution based on their own situation
  - Margie chose the raised toilet seat
    - Most affordable
  - Billie chose the “comfort height” toilet
    - Affected the appearance of her home the least

Adherence Study Summary

- Background
  - General adherence rates for home modifications and adaptive equipment have been reported to be as low as 45%.
- Procedures
  - We evaluated adherence in a population of older adults who received home modifications as a part of our clinical program. A group of 58 older adults who received home modifications from 1999-2007 were contacted in 2008.
- Results
  - Adherence rates were high for both groups even up to 9 years after implementation (mean adherence rate: 84%). Analyses revealed no significant difference in adherence rates between those who paid out of pocket and those who received them for free.
- Implications
  - A client-centered approach that addresses functional problems identified by participants demonstrates a high adherence rate.