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EVALUATION OF HOME ACCESSIBILITY: THE FIRST STEP IN ENSURING PROPER FIT TO IMPROVE FUNCTION

Kimberly A. Furphy, DHSc, OT
Associate Professor of Occupational Therapy
Stockton University, Galloway, NJ
Kimberly.furphy@stockton.edu

Course Outcomes

• As a result of this course, participants will be able to:
  • Describe the process in selecting appropriate assessment tools for home safety/modification evaluation.
  • List appropriate assessment tools to use for evaluation of outdoor and indoor environments.
  • Apply knowledge gained about home evaluation to clinical scenarios/situations.
A Little About Me…. 

- Associate Professor and Program Director of MSOT Program at Stockton University since 2000
  - Teach Adult Evaluation and Intervention courses and Assistive Technology course
- Have been working with clients with primarily neurological conditions since 1995, but have also worked in home care
- Main areas of practice…
  - Assistive Technology interventions
  - Wheelchair Seating and Positioning
  - Home Modification

A Little About You…. 

- Primary areas of practice?
  - Hospital/rehab/SNF based practice?
  - Home based practice?
  - Out-patient?
  - Other?
- Who has worked in home modification in the past?
  - 0-5 years?
  - 5-10 years?
  - > 10 years?
- Comfort with home modification practice?
  - Very comfortable?
  - Comfortable?
  - Not comfortable?
Home Modification Process

• Referral & Screening
  • Reason for referral
    • New injury or diagnosis
    • Change in function due to aging
    • Moving to new home
    • Change in caregiver or other factors
  • Consider information from the referral
  • Consider funding sources

• Evaluation
  • Schedule Visit
  • Gather evaluation tools, paperwork, and other information

  • Perform Evaluation
    • Various techniques and tools
  • Write up report
    • Includes seeking assistance from other professionals, as needed

• Intervention
  • Complete home modifications with all involved
    • Client
    • Caregivers/Family
    • Contractors/Building Professionals
    • Funding sources
  • Training in use of modifications

• Follow up
  • Evaluate Home Modifications
    • Improvement in function?
    • Decrease in risk for falls?
    • Satisfaction with modifications made?
  • Tools to use
    • Function-standardized ADL and IADL Evaluation tools
    • Falls Risk-falls risk tools
    • Satisfaction and Well-being Tools
Framework for Home Modifications

- Several Frameworks can be applied for the Home Modification Process
  - Must stress client-centered practice
    - Unique qualities of each individual
  - Must address
    - individual attributes
    - occupational performance (& participation) attributes
    - environmental supports and barriers
      - Both home and community, if applicable
  - Ecological models seem to “fit” best

Person-Environment-Occupation-Performance Model (PEOP)

- Person
  - Values & Interests; Skills & Abilities; Life Experiences
- Environment
  - Physical, Cultural, & Social Components
- Occupation
  - self directed meaningful tasks and activities engaged in throughout a lifespan
- Performance
  - Ability to perform and participate in occupations

Law, et al., 1996
Baum & Christiansen, 2005
Purpose of the Home Evaluation

- Identifies the “goodness of fit” (ecological models) between the person, their occupations, and the environment
- Several Areas addressed during the process:
  - Safe and independent ADL and IADL performance, including the risk for falls
  - Safe and independent mobility in ADL and IADL performance, including the risk for falls
  - Family/caregiver ability to care for their loved ones
  - Feasibility of remaining in the home if proper modifications are completed
Evaluation Strategies

• Interview
  • Confirm all information provided with referral
  • Gives clients’ view of occupational performance and participation and factors affecting OP&P
  • Various informal and/or semi-/structured interview techniques can be used
    • Informal discussion with probing questions
      • Client/caregiver tells his/her story
    • Semi-structured interviews (i.e COPM)
    • Structured interviews and checklists
  • Result is qualitative data
    • Be aware of…Client inaccuracy with information, especially in regards to status of their occupational performance and participation

Evaluation Strategies

• Observation
  • Used primarily to ascertain clients’ occupational performance and participation
  • Starts immediately upon entering the home
  • Ask clients to perform specific ADL, IADL, and mobility tasks, especially those identified as problematic during interview
  • Can be informal, but MANY observation-based standardized tools are available to evaluate functional status
    • i.e. PASS-HOME, FIM, AMPS, ADL Profile
  • Result is qualitative and/or quantitative data
    • Be aware that…it is BEST to use standardized tools for initial evaluation
      • Helps with outcomes measurement
Evaluation Strategies

• Measurement
  • Used to measure persons (including caregivers), environments, equipment
  • Various tools available to ascertain this information
  • Result is quantitative data
  • Be aware that...inaccurate measurements WILL impact outcomes significantly—we will talk more about this later as well as more specific techniques for measurement!

Evaluation Strategies

• Standardized Assessment
  • Can involve interview, observation, measurement, or any combination of the 3
  • Tools developed and tested to ensure validity (trustworthy, measures what is intended) and reliability (consistency) of the data gathered
  • Systematic and follow a prescribed administration and interpretation procedure
  • Can give qualitative and/or quantitative data and are often, but not always, compared to norms
  • Several standardized tools are available to measure occupational performance, accessibility and safety of the environment, and outcomes from interventions
  • There is a list of standardized tools at the end of the presentation under "Resources"
How to Select Assessment Tools and Perform Home Evaluations

• Therapists use Clinical Reasoning to determine evaluation strategies and tools to use

• 4 Types of Reasoning
  • Scientific
    • Logical, involves both diagnostic and procedural reasoning
    • Therapists review information and make hypotheses about a client's occupational performance difficulties based on personal knowledge and professional experience
  • Narrative and Conditional
    • Client tells his/her story
    • Therapist interprets the information provided and makes determinations about the impact of the injury or illness on the client's occupational functioning
  • Pragmatic Reasoning
    • Consideration of the practicalities that might affect the evaluation process (i.e. therapist competence and knowledge, reimbursement, time factors, caregiver influence)
    • Therapist considers these factors when determining when and how to perform the evaluation and which tools would make the process most efficient
  • Ethical Reasoning
    • Consideration of therapist skills and values, client values and other factors, and service delivery factors that might impact the quality of services delivered
    • Therapist considers these factors in determining the best approaches to use to ensure quality of services
Case Study

- Mary
  - 75 year old woman
  - Diagnosed with R CVA and mild L hemiparesis
  - PMH- HTN, NIDDM, and LE/UE OA
  - Husband is 78, has mobility issues due to arthritis and LE orthopedic injuries sustained on the job
  - Lives in 1 story home
    - 5 steps to landing, then 1 step to enter main door
    - 16 steps to basement where laundry facilities are located
    - Galley kitchen with standard height cabinets and countertops; side by side refrigerator
    - Bathroom has standard height toilet, standard tub with sliding glass enclosures; bathroom is small
    - Living room is carpeted, but all other flooring is wood, except tile in bathroom

Case Study

- Therapist reviews referral information
  - Draws conclusions as to what potential occupational performance difficulties Mary may have based on Dx (Scientific Diagnostic Reasoning)
  - Enters evaluation with Mary with some idea of what techniques and tools she may use in the evaluation (Scientific Procedural Reasoning)
  - Also considers time needed, reimbursement factors, caregiver availability, therapist experience (Pragmatic Reasoning)
  - All along considering therapist values, knowledge, competence to proceed with evaluation (Ethical Reasoning)
Case Study

- Therapist asks Mary about her perception of her occupational performance and factors she thinks are supporting or impeding her functioning (Interview; Narrative Reasoning)
  - Draws conclusions as to what potential occupational performance difficulties Mary may have based on Mary’s perceptions (Scientific Diagnostic Reasoning)
  - Therapist determines what further techniques and tools she may use in the evaluation (Scientific Procedural Reasoning)
  - Also considers time needed, reimbursement factors, etc. (Pragmatic Reasoning)
  - All along considering therapist values, knowledge, competence to proceed with evaluation and to meet clients’ needs (Ethical Reasoning)

Case Study

- Therapist asks Mary to perform tasks in their natural environment to determine factors he/she sees are supporting or impacting impeding her functioning (Observation; Standardized Assessment)
  - Can include measurement of the client, mobility devices, and the environment, which we will speak about later in the presentation
  - Therapist gathers qualitative and quantitative data from the observations and standardized assessments
    - used to further refine and determine which factors are supporting or impeding Mary’s occupational performance
  - All along considering therapist values, knowledge, competence to proceed with evaluation and to meet clients’ needs (Ethical Reasoning)
Case Study

- Therapist completes her report
  - Contacts support services (i.e contractors, other therapists/mentors to assist with items out of therapists skill set) (Ethical Reasoning)
  - Provides specific qualitative and quantitative data obtained from all aspects of the evaluation
  - Determines interventions that would be appropriate for Mary based on the information provided in the evaluation (Scientific Diagnostic and Procedural Reasoning)
  - Also considers time needed, funding factors, client acceptance of intervention, therapist experience (Pragmatic Reasoning)
  - Provide the client with the report and discuss any concerns (Ethical Reasoning)

Specifics of Measurement

- Measurements MUST...
  - Be accurate to ensure proper modifications to support occupational performance

- Inaccurate measurements WILL...
  - Impact clients’ acceptance of recommended modifications
  - Affect the design and fit of any modifications recommended, which may also create greater financial burdens
  - Impact clients’ functioning resulting in falls, increased dependence on caregivers, and possibly relocation to another environment
Measurement Considerations

• Anthropometry
  • Study of the measurements and proportions of humans
    • Structural
      • Static measurements taken while person is standing and/or sitting
    • Dynamic
      • Measurement of the person while in motion (i.e. reach, movement during tasks)

• Why is this important in home modification evaluation?
  • Allows for standardization of measurement of individuals to achieve best fit between person, environment, and occupational performance

Ainsworth & de Jonge, 2011

Measurement Considerations

• Biomechanics
  • Study of the influence of mechanical laws (i.e. forces, levers, torque) on the movement or structure of individuals (i.e. range of movement, accuracy, speed, strength, endurance)
  • Helps to identify the quality of movement, the effectiveness of performance, and potential for injury

• Why is this important in home modification evaluation?
  • Allows therapist to identify postures that will maximize movement in tasks and to assist in planning for modifications to enhance those postures.

Ainsworth & de Jonge, 2011
Measurement Considerations

• Ergonomics
  • The study of efficiency and competence in completing everyday tasks
  • Involves task analysis and user trial (observation of client in task performance)

• Why is this important in home modification evaluation?
  • Allows the therapist to determine which environmental factors are impacting the efficiency and competency of the individual when performing tasks

Ainsworth & de Jonge, 2011

Measuring the Person

• Consideration of client factors
  • allows the therapist to determine the space they require for occupational performance and for placement of environmental fixtures and fittings

• Measure in both static and dynamic postures
  • Allows the therapist to determine actual space needed, especially when the client is performing tasks
  • Should consider the posture the client takes when performing a particular task (i.e. sitting, standing, kneeling, lying, bending)

Ainsworth & de Jonge, 2011
Measuring the Person

• Height
  • measure vertically from floor to crown of head (standing and seated)
  • Gives vertical clearance needed to access spaces, enter doors
• Shoulder Height
  • measure from floor to acromion (standing and seated)
  • Gives reference for location of fixtures and controls

• Knee Height
  • measure vertical distance from floor to top of knee (quadriceps)(seated)
  • Gives clearance needed for under tables
• Popliteal Height
  • measure from floor to under popliteal area of knee (seated)
  • Gives maximum height of seat

Ainsworth & de Jonge, 2011

Measuring the Person

• Hip Width
  • measure horizontally across the hips (seated)
  • Gives minimum width of seat
• Femoral Length
  • measure from rear of buttocks to popliteal area in back of knee (seated)
  • Gives maximum depth of seat

• Hand Width
  • measure across palm of hand
  • Gives clearance needed for hand access to handles and rails
• Eye Height
  • measure from floor to inner corner of eye
  • Gives sight lines and height of visual obstructions

Ainsworth & de Jonge, 2011
### Measuring the Person

**Reach Ranges**
- Reach in different postures is measured.
- Allows therapist to determine placement, width and height of items in the environment (i.e. cabinets, light switches, appliances).

<table>
<thead>
<tr>
<th>Action</th>
<th>Measurement Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal Reach</td>
<td>Measure from client back to fingertip of horizontally outstretched arm at shoulder height</td>
</tr>
<tr>
<td>Forward Horizontal Functional Reach</td>
<td>Measure from client back to fingertip of horizontally outstretched arm as client leans forward</td>
</tr>
<tr>
<td>Forward Diagonal Functional Reach</td>
<td>Measure from floor to fingertip of diagonally outstretched arm as client leans forward</td>
</tr>
<tr>
<td>Side Horizontal Functional Reach</td>
<td>Measure from floor to fingertip of laterally outstretched arm as client leans laterally</td>
</tr>
<tr>
<td>Side Diagonal Functional Reach</td>
<td>Measure from floor to fingertip of laterally outstretched arm at shoulder height</td>
</tr>
</tbody>
</table>

Ainsworth & de Jonge, 2011

### Measuring Mobility Equipment

- **Need to consider**
  - Stationary equipment
    - Stored or folded (length, width, height)
    - Used in stationary activities (L, W, H, and foot, back, and arm support assemblies)
  - Dynamic equipment
    - Used during dynamic and mobility activities

- **Also need to consider if the equipment is**
  - Occupied
    - For function
    - Often have other devices on them (i.e. O2 tanks, laptrays)
  - Not occupied
    - For storage, for transport
<table>
<thead>
<tr>
<th>Measuring Mobility Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wheelchairs</strong></td>
</tr>
<tr>
<td>• Static and Dynamic Measure</td>
</tr>
<tr>
<td>• height from floor to highest point</td>
</tr>
<tr>
<td>• width between outermost manual wheelchair pushrims (or client's hands on rims if occupied)</td>
</tr>
<tr>
<td>• length from back of rear wheel or wheelchair (powered) to front of footplate or client toe (if occupied)</td>
</tr>
<tr>
<td>• Dynamic-consider maneuvering space or turning radius needed</td>
</tr>
<tr>
<td>• 360 degree turn test</td>
</tr>
<tr>
<td>• 180 degree turn test</td>
</tr>
<tr>
<td>• 90 degree turn test</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measuring Mobility Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Walkers</strong></td>
</tr>
<tr>
<td>• Static and Dynamic Measures</td>
</tr>
<tr>
<td>• height from floor to highest point</td>
</tr>
<tr>
<td>• width between outermost frame or wheels</td>
</tr>
<tr>
<td>• length from back of frame to front of frame</td>
</tr>
<tr>
<td>• Functional reach measurements of the client become important,</td>
</tr>
<tr>
<td>• Dynamic-consider maneuvering space or turning radius needed with walkers, especially in tight spaces</td>
</tr>
<tr>
<td>• 360 degree turn test</td>
</tr>
<tr>
<td>• 180 degree turn test</td>
</tr>
<tr>
<td>• 90 degree turn test</td>
</tr>
</tbody>
</table>
Measuring the Environment

• Dimensions
  • Look at length, width, and height of items in the environment using key reference points (i.e. inside face of door jamb on latch side of door)
  • Many resources available to guide the therapist in measuring these features in the environment
    • Comprehensive Assessment and Solution Process for Aging Residents (CASPAR)
  • Tools used to measure dimension

Measuring the Environment

• Gradient
  • Slope affects persons ability to move around their home
  • 2 techniques
    • Trigonometric Calculations
      • Horizontal and Vertical Measurements plus inclined length
      • Many Gradient Calculations Resources online to do the math!
    • Gradient Measuring Device (Inclinometer)
Measuring the Environment

• Light
  • Indoor
    • Ambient and Artificial Light
    • Evaluate lighting in different parts of the home
    • Make sure to take readings at different times of the day as ambient light changes
  • Use light meter
    • Stairs
    • Entries and Hallways
    • Kitchens
    • Living Areas
    • Bathrooms
    • Bedrooms

Measuring the Environment

• Force
  • Required to open, hold, or swing doors, drawers, and windows
  • Door force gauges
    • For PUSH
      • Place gauge where force is applied
      • Move uniformly and slowly
    • For PULL
      • Place hook on handle
      • Pull perpendicularly to handle
Evidence Based Considerations


Evidence Based Considerations


Summary

• The Home Modification Process has 4 steps
  • These are no different than the process used in other Occupational Therapy encounters
• There are Frameworks (PEOM, PEOP, among others) that are used in guiding the therapist in the process
• There are several strategies that therapists can employ during the evaluation process
  • These are no different than the strategies used in other Occupational Therapy encounters

Summary

• Therapists use different types of clinical reasoning in guiding their choices during the evaluation process
  • These are no different than the clinical reasoning used in other Occupational Therapy encounters
• Proper Measurement is paramount in ensuring that home modifications that are recommended meet the client’s needs
  • Measures of the person, mobility equipment, and environment must occur
### RESOURCES

**Measures of Occupational Performance and Participation**
- Canadian Occupational Performance Measure (COPM)
- Activity Card Sort (ACS)
- Performance Assessment of Self-care Skills-Home (PASS-Home)
- Activities of Daily Living Profile (ADL Profile)
- Client-Clinician Assessment Protocol (C-CAP)

**Measures of the Home Environment**
- Home Falls and Accident Screening Tool (HOME FAST)
- Home Environmental Assessment Protocol (HEAP)
- Westmead Home Safety Assessment (WESHA)
- SAFER-HOME v.2
- Housing Enabler
- Safety Assessment of Function and the Environment for Rehabilitation (SAFER)

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**Measures of Quality of Housing**
- Usability in my Home (UIMH)
- Meaning of Home (MOH)
- Housing-Related Control Beliefs Questionnaire

**Other Outcome Measures**
- OTFACT
- Assessment of Life Habits (LIFE-H)
- Participation and Autonomy Questionnaire (IPA)

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de Jonge, D. (2011)
QUESTIONS????

Kimberly.furphy@stockton.edu

References


References


References

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