The Mayo-Portland Adaptability Inventory (MPAI-4): Overview

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Acknowledgement

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Mayo-Portland Adaptability Inventory: MPAI-4

- Structure for neuropsychological or team outpatient evaluation
- Outcome and program evaluation
- Input from patient and significant other
- Available in English, Spanish, Danish, French, German, Swedish, Portuguese, Hebrew, Dutch
- www.tbims.org/combi/mpai
A Comprehensive Measure: MPAI-4

• Current version is product of over 15 years of research
• 30-items
• Three subscales: Ability, Adjustment, Participation
• Psychometric properties established using classic and modern psychometric techniques
Measurement Methodology: Traditional vs. Rasch

• Identifies items ordinally related to each other and to people as described by a linear construct
• Each item represents a level on the construct
• Misfitting or redundant items are discarded
• Quantitative relationship among items can be translated to a parametric equivalent measure
Measurement Methodology: Traditional vs. Rasch

Traditional:
- Relationship of numbers to other numbers
- Typically assumes items have same value and are additive

Rasch:
- How numbers distinguish among people
- Items may have varying impact in describing a linear dimension
MPAI-4: Concurrent and Predictive Validity

• Disability Rating Scale, Rancho scale, neuropsychological measures, and MPAI completed by a significant other (Bohac, Malec, & Moessner, 1997; Malec & Thompson, 1994)

• Outcome of Comprehensive Day Rehabilitation Program (Malec, 2001)

• Outcome of Specialized Vocational Services (Malec, Buffington, Moessner, & Degiorgio, 2000)

• Intensity of outpatient rehabilitation required for return to work (Malec & Degiorgio, 2002)
MPAI-4: Ability Index

- Mobility
- Use of hands
- Audition
- Vision
- Motor speech
- Dizziness
- Verbal Communication
- Nonverbal Communication
- Memory
- Attention/
  concentration
- Fund of information
- Novel Problem-solving
- Visuospatial abilities
MPAI-4: Adjustment Index

- Anxiety
- Depression
- Irritability, anger, aggression
- Pain/headache
- Fatigue
- Sensitivity to mild symptoms
- Inappropriate social interaction

- Impaired self-awareness
- Family/significant relationships
- Initiation
- Social contact
- Leisure activities
MPAI-4: Participation Index

- Initiation
- Social contact
- Leisure activities
- Self care
- Residence
- Transportation
- Employment
- Managing Money
MPAI-4 Co-morbidities

- Alcohol/other substance abuse or dependency
- Legal issues
- Other disabling conditions
Levels of Measurement: Focused

- Participation Index
- Represents last and most meaningful challenges for rehabilitation
- Perspectives of person with TBI, SO, staff
  - vs. rater bias
- 3-rater Participation Index correlates highly with Full Scale ($r = .76$)
- Minimal ceiling effects
Cumulative Distributions of Participation Index
Total Raw Scores by Rater Group and 3-Rater Composite

- 3-rater composite
- People with ABI
- SO
- Staff

Total Raw Score
The National Database Project
MPAI-4 Database Project

• Small Business Technology Transfer Program (STTR)
  – Tom Murphy, PI/CEO Inventive Software Solutions, Philadelphia
  – John Seeley, Jeff Gau, Brian Danaher: Oregon Research Institute, Portland
  – Jim Malec: Rehabilitation Hospital of Indiana/IU School of Medicine
MPAI-4 Database Project

- Develop a national data base system for the Mayo-Portland Adaptability Inventory (MPAI-4)
- Web-based, secure, user friendly
- To measure outcomes and change over the course of postacute rehabilitation
- And provide feedback to providers about the effectiveness of their programs relative to other similar programs for similar patients
MPAI-4 Database Project

- A Web-Enabled Client/Person Served Outcomes Reporting Service for any size provider (HIPAA compliant)
- Each organization’s data is protected and secured
- Allow individual organizations to compare and analyze their internal data to regional or national data
- Developing normative data for post-hospital brain injury
- Can add tools/scales in addition to MPAI-4
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<thead>
<tr>
<th>Part A. Abilities</th>
<th>Part B. Adjustment</th>
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<td><strong>2. Use of Hands</strong></td>
<td>14. Depression</td>
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<td><strong>3. Vision</strong></td>
<td>15. Irritability, anger, aggression</td>
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<td><strong>7A. Verbal</strong></td>
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<td><strong>7B. Nonverbal</strong></td>
<td>20. Impaired self-awareness</td>
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<td><strong>11. Novel Problem-solving</strong></td>
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REPORTING AND ANALYSIS
Data Analysis

**Individual**
- Reflects Improvement, Regression or Maintenance of Functional Status
- Facilitates Treatment planning

**Facility Data Analysis**
- Help to identify client trends

**Group Data Analysis**
- Create normative data
Sample Group Data Analysis

- By Funder type
- By Age at injury
- By Age at first admission to Rehab
- By Cause of Injury & Type of Injury
- By Years post-injury prior to admission
- By Program Description
- By Functional Category (improved, maintained regressed)
- By Demographics
MPAI-4 Database Project

• Provide feedback to providers about the effectiveness of their programs relative to other similar programs for similar patients
• Provide Data Useful for:
  – Advocacy
  – Policy Development
  – Disability Determination
  – Determination of Needs for Medical, Rehabilitation, Vocational, Independent Living and Other Services for people with ABI
The MPAI-4 in Practice
Outcome Measurement and Analysis
MPAI - Total Standard Score by Group at Admission and Discharge

<table>
<thead>
<tr>
<th>T-score</th>
<th>Program Completers</th>
<th>Precipitous Discharge</th>
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Admission

Discharge

T-score
T-scores for MPAI-4 Indices at Admission and Discharge by Group

Abilities Adjustment Participation

MPAI-4 Index T-score

CCT-Admission  CCT-Discharge  PD-Admission  PD-Discharge
MPAI Participation Index Standard Score by Group on Admission, Discharge, and 3- and 12-month Follow-up

Program Completers
Precipitous Discharge

<table>
<thead>
<tr>
<th>T-scores</th>
<th>Admission</th>
<th>Discharge</th>
<th>3-month</th>
<th>12-month</th>
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Admission Discharge 3-month 12-month
MPAI - Total Standard Score for Chronic Cases (Time since Injury > 1 year) by Group at Admission and Discharge

<table>
<thead>
<tr>
<th>T-scores</th>
<th>Admission</th>
<th>Discharge</th>
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<tbody>
<tr>
<td>Program Completers-Chronic (n=94)</td>
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<tr>
<td>Precipitous Discharge-Chronic (n=20)</td>
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Outcomes by Program Type and Goals

The Pennsylvania Association of Rehabilitation Facilities (PARF)
MPAI-4
Raw Scores after 1st Post-admission assessment
[corrected for Chronicity and Initial Disability]
MPAI-4 Total Raw Score by Program Type over Time

1st Assessment

2nd Assessment

- Intensive Residential
- Residential Supported Living
- Intensive Community
- Community Supported Living
Programmatic Differences in Outcome Expectations

- Average chronicity for all programs > 5 years
  - Greatest for Supported Living Programs
- Stability = Goal of Residential and Supported Living Programs
- Progress = Goal of Intensive Programs
- Goals appropriately adjusted for chronicity and severity of disability
Planning and Monitoring Individual Progress

Keyforms
Helen Badge & Jennie Brentall
New South Wales, Australia
Demonstrating Change
Linking the MPAI-4 to the International Classification of Functioning (ICF)

• Principal Investigator: Jan Lexell, M.D., Chair, PM&R, Lund University, Sweden
• Co-investigator: Lars Jacobsson, neuropsychology doctoral candidate, Lund University
Linking the MPAI-4 to the International Classification of Functioning (ICF)

• Each item links to specific functional areas that may be targeted for intervention

• Linkage is more specific for Ability and Participation than Adjustment
ICF Linking Examples:
Verbal Communication

- b1670 Reception of language
- b1671 Expression of language
- b1672 Integrative language functions
- d166 Reading
- d170 Writing
- d310 Communicating with - receiving - spoken messages
- d320 Communicating with - receiving - formal sign language messages
- d325 Communicating with - receiving - written messages
- d330 Speaking
- d340 Producing messages in formal sign language
- d345 Writing messages
- d3600 Using telecommunication devices
- d3601 Using writing machines
- d3602 Using communication techniques
ICF Linking Examples: Residence

- d2301 Managing daily routine
- d2302 Completing the daily routine
- d2303 Managing one's own activity level
- d5700 Ensuring one's physical comfort
- d5701 Managing diet and fitness
- d5702 Maintaining one's health
- d6300 Preparing simple meals
- d6301 Preparing complex meals
- d6400 Washing and drying clothes and garments
- d6401 Cleaning cooking area and utensils
- d6402 Cleaning living area
- d6403 Using household appliances
- d6404 Storing daily necessities
- d6405 Disposing of garbage
- d6500 Making and repairing clothes
- d6501 Maintaining dwelling and furnishings
- d6502 Maintaining domestic appliances
- d6503 Maintaining vehicles
- d6504 Maintaining assistive devices
- d6505 Taking care of plants, indoors and outdoors
- d6506 Taking care of animals
ICF Linking Examples: Anxiety, Depression

- b1520 Appropriateness of emotion
- b1521 Regulation of emotion
- b1522 Range of emotion
Take Home Points

- The MPAI-4 and the Client Info System are based on state-of-the-art psychometric and database technologies.

- The MPAI-4 Client Info System will support:
  - Rehabilitation program evaluations using large national samples.
  - Rehabilitation program planning and monitoring in individual cases.
  - Data for advocacy and policy development.
Key References


• Malec J, Lezak M. Manual for the Mayo-Portland Adaptability Inventory. www.tbims.org/combi/mpai


• Malec JF. Comparability of Mayo-Portland Adaptability Inventory ratings by staff, significant others and people with acquired brain injury, Brain Inj 2004;18:563-75.

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www.tbims.org/combi/mpai
www.clientinfo.inventivesoftware.net