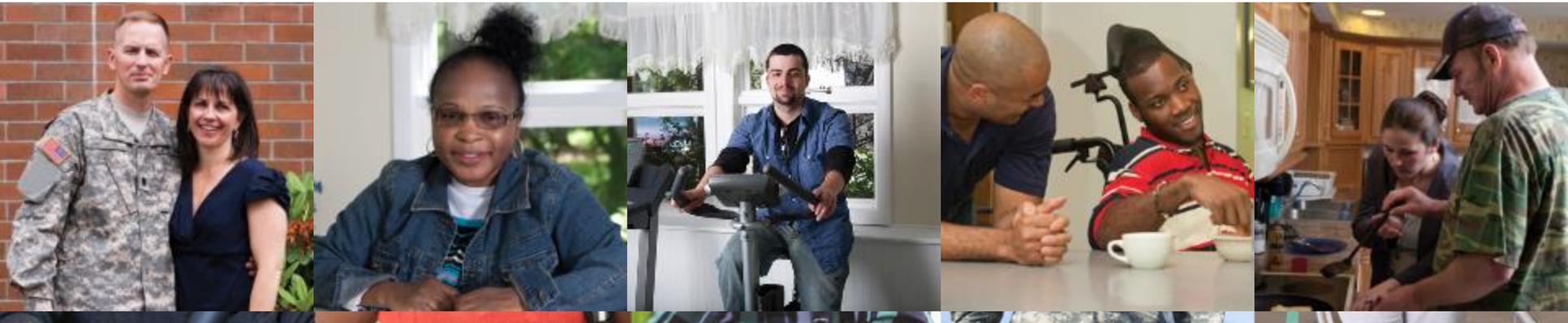




NEURO
INSTITUTE

Continuing Education for Rehabilitation Professionals



The Quality of Rehabilitation: Individualized Care NeuroInstitute CE Program 2018

Gordon J. Horn, Ph.D. & Frank D. Lewis, Ph.D.
National Analytics & Outcomes



NEURO
INSTITUTE

Continuing Education for Rehabilitation Professionals

This program is provided by the NeuroInstitute - the educational division of NeuroRestorative.

CE programs are offered all year on the last Friday of each month.

Email stephanie.tinnon@neurorestorative.com for credit. A quiz must be completed.



Learning Objectives

At the conclusion of this activity, the participant will be able to:

1. Develop a measurable individualized rehabilitation plan of care
2. Differentiate models of rehabilitation including a traditional rehabilitation approach of strengths and weaknesses vs. a hierarchical model of care.
3. Understand how to provide rehabilitation regardless of time since injury.
4. Understand how to provide quality of care for the individual served.

Part I

Measurable Individualized Rehabilitation

Change from Admission to Discharge

FIM vs. Mayo Portland

Understanding the differences between the use of the Functional Independence Measure (FIM - Hospital) and the MPAI-4 (Post)

- When to use the Functional Independence Measure (FIM) – Acute Care measurement
 - Acute Hospital Floor – NICU, Neuro step down
 - Acute Rehabilitation Center
- When to use the Mayo Portland Adaptability Inventory-4 (MPAI) Post-Acute Care Measurement
 - Post Acute Rehabilitation
 - Day Treatment
 - Outpatient
 - Home and Community

MPAI-4 Subscales

Post Hospital Care Measurement

- The Mayo Portland is now in the **4th revision**; the ratings have been tested in multiple ways to refine what is measured and how this relates to rehabilitation planning and outcome (e.g., clinical interventions).
- Measure: **29 items that are evaluated with ratings that range from 0-4**, and 6 additional items that record pre-injury and post-injury information about the person.
- Three subscales:
 - **Ability Index** (sensory, motor, and cognitive abilities)
 - **Adjustment Index** (mood, interpersonal interactions, family interactions)
 - **Participation Index** (social contacts, initiation, money management, residence)

Scoring Levels Review



Focus: think about the level of functional impairment of the participant

0 = no problems; no adaptive devices are used

1 = Mild problem, but does not interfere with activities; may use assistive device or medication to manage

2 = Mild problem; interferes with activities 5-24% of the time; 75% of the time the persons adapts

3 = Moderate problem; interferes with activities 25-75% of the time; 24% or less the person adapts

4 = Severe problem; interferes with activities 76-100% of the time; rarely can the person adapt

Mayo Portland

Abilities

Physical, Cognitive, Communication



Part II

Traditional Rehabilitation vs. Hierarchical Model

Traditional Methods of Rehabilitation

A key element is the perspective of the “evidence”.

Traditional methods show the following treatment method:

Patient -> Assess -> Plan -> Implement -> Examine, e.g., measure and analyze outcomes (better, worse, same). This method provides the potential for translational programming – IF, follow up research is performed.

- “Neurological rehabilitation can often improve function, reduce symptoms, and improve the well-being of the patient.”
- The goal is a disease model of thinking, with outcome expectations showing a difference from the start of treatment to the end of treatment.
- Use of strengths to remediate weaknesses.

(Johns Hopkins Medicine, 2016)

Traditional Rehabilitation

Assess multiple areas of function, then determine what is “normal”, then consider the weaknesses that require rehabilitation efforts using traditional therapeutic intervention.

Example:

Mobility is impaired – Physical Therapy works to restore strength, coordination, and ultimately balance and movement.

Activities of Daily Living – Occupational Therapy works to restore, improve, coordinate upper and lower extremity skills, and ultimately helping an individual to perform daily tasks in living.

Communication – Speech Therapy works to restore understanding and expressing toward others with the goal of managing in the community.

Part III

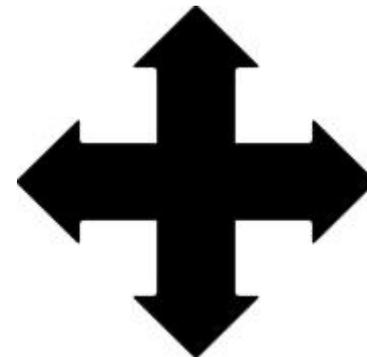
Theory to Practice

Disruption by Evidence

Disruption...

The world-wide healthcare needs have changed.

If we consider the problem from a different angle, then maybe we will see things in a way that leads to discovery.



Our changing healthcare industry requires “evidence” to measure and validate...

But most importantly... discovering things that work for reasons that may not always be apparent at first!

Rasch Review

Rasch analysis was conducted for purposes of determining reliability and construct validity of the MPAI-4 as a measure of disability following brain injury.

The model compares expected from the actual values of an item.

In other words...

Do the actual results conform to what would be expected from a reliable measure of the construct?

Rasch Review

More specifically, this analysis has been used to demonstrate two important concepts with measures such as the MPAI-4: item and person fit.

How items contributing to a measure represent the underlying construct (disability),

... and ...

How well the items provide a range of indicators that reliably differentiate among people rated with the measure.”

(Malec & Lezak, 2008)

Rasch Review

Other key measures are Person and Item Reliability and Person and Item Separation.

Person Reliability indicates how well a measure's items distinguish among individuals (e.g. discriminate persons into levels or strata sufficient for the population of interest – example: 3 or 4 levels). A coefficient of **0.80** or greater is considered acceptable for Person Reliability.

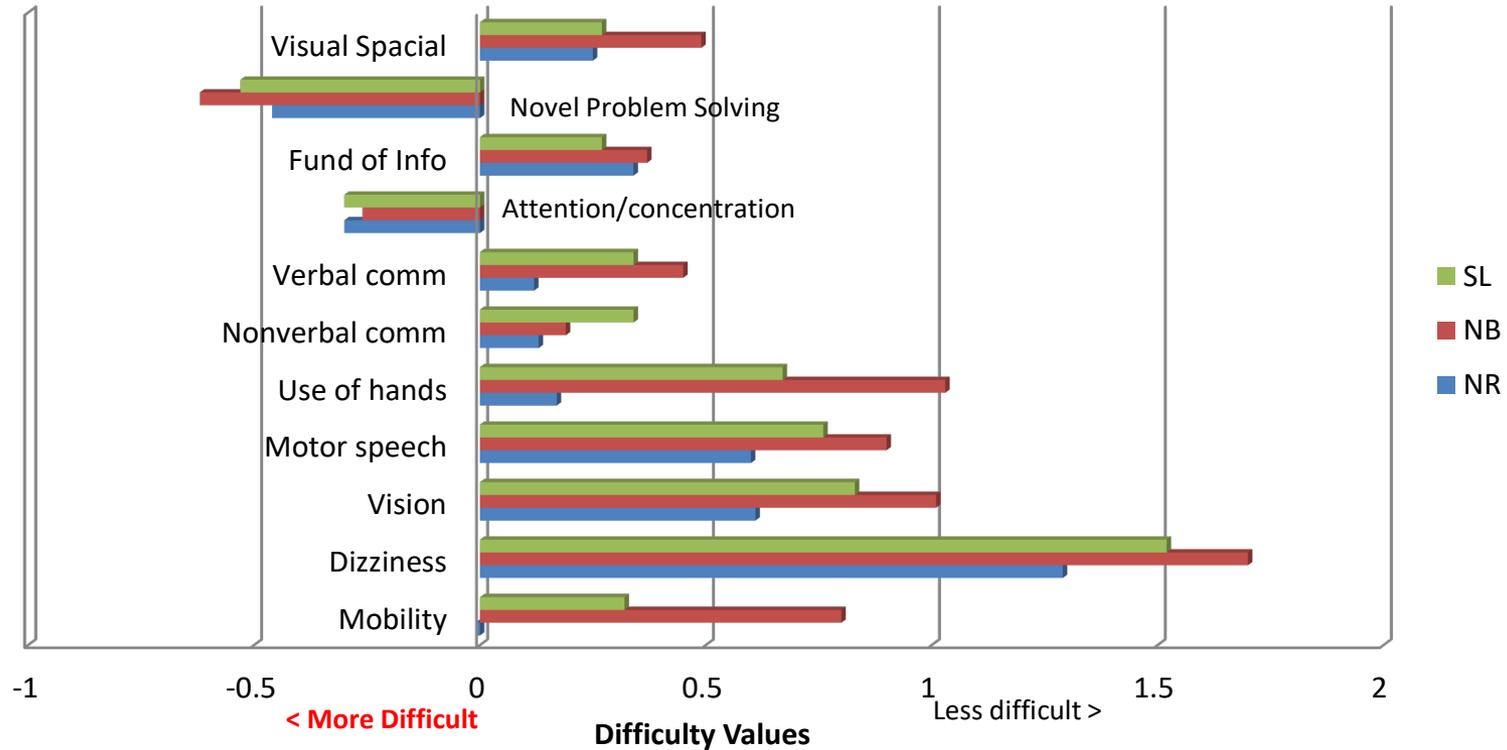
Item Reliability refers to whether test items relate to each other in a consistent way in describing a disparate group of individuals (e.g., easy to difficult items, wide difficulty range needed for high item reliability). A coefficient of at least **0.90** is optimal for Item Reliability.

(Bond & Fox, 2001).

Rehabilitation Modeling: From Evidence to Quality

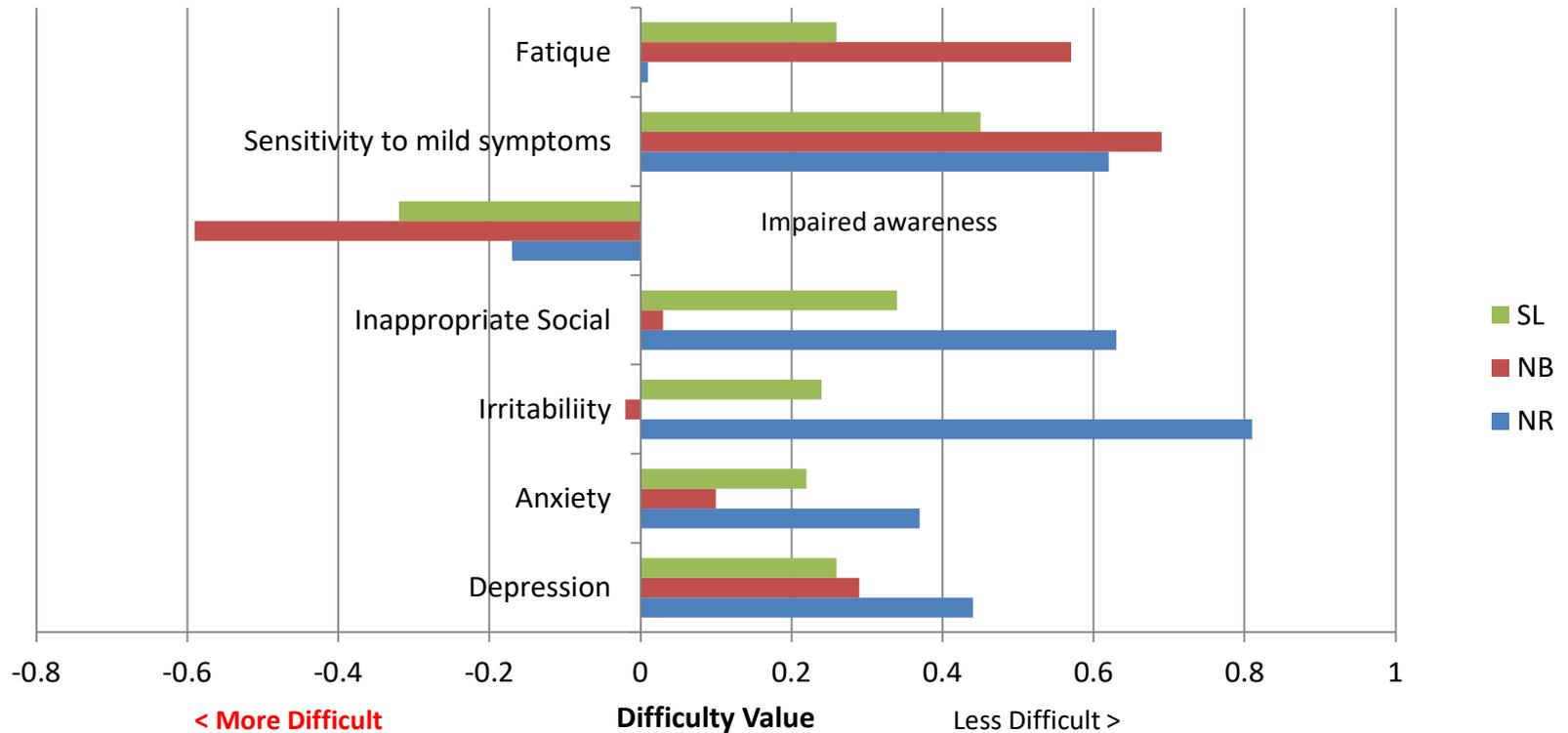
Rasch Analysis for evidenced-based care in post-hospital neurological rehabilitation

Item Difficulty by Program Type: Abilities



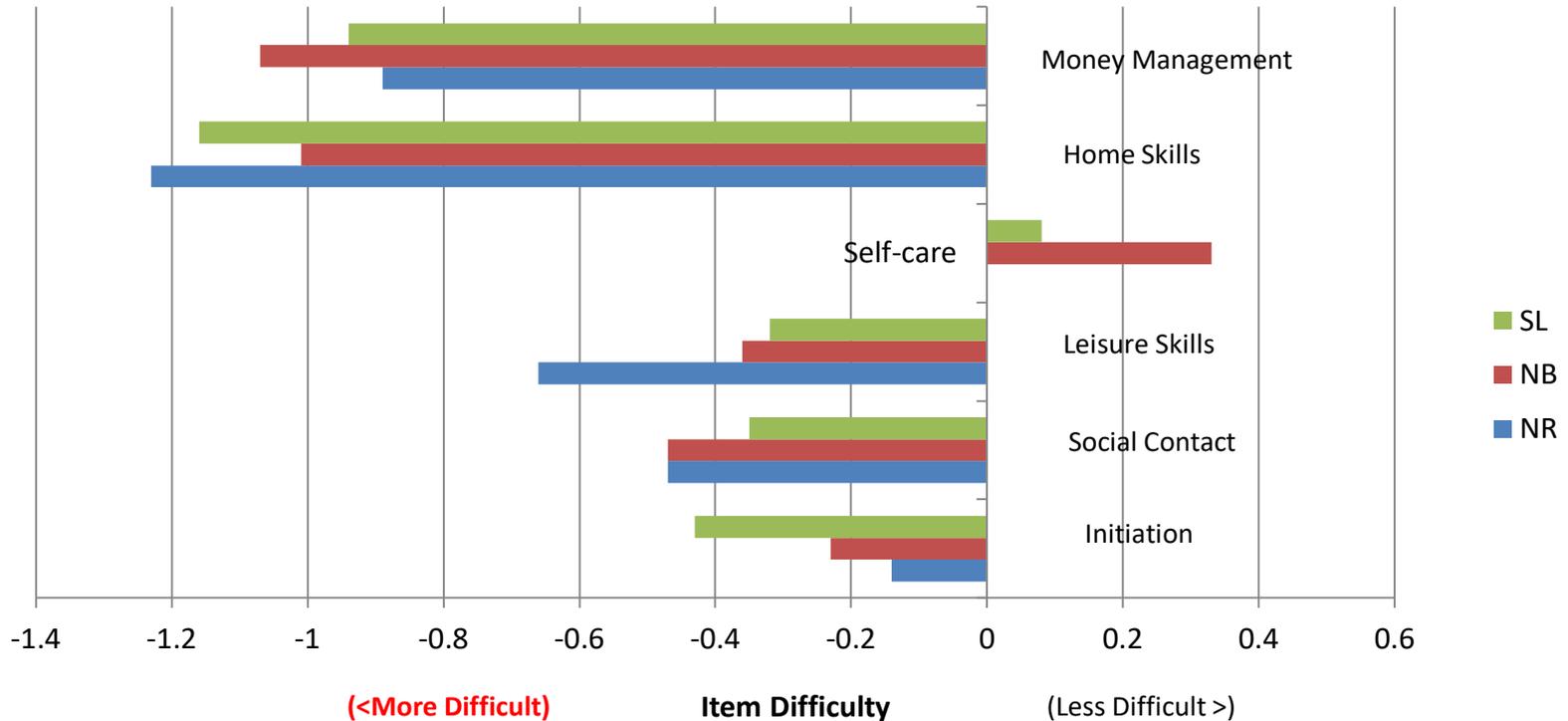
The neurorehabilitation group presented the greatest level of disability. This group demonstrated the greatest magnitude of disability on 8 of 11 items, followed by the SL and NB groups. All three groups showed the greatest disability with the Novel Problem Solving and Attention/Concentration items.

Item Difficulty by Program Type: Adjustment



Participants in the NB programs showed the greatest level of disability on Adjustment items. The three MPAI-4 items most characterized by a neurobehavioral participant (Irritability, Impaired Awareness, and Inappropriate Social Behavior) were observed as having the greatest disability among these study participants, and were rated as more difficult than for NR and SL participants.

Item Difficulty by Program Type: Participation



Participation items were the most difficult for participants in all three groups. The Money Management and Home Skill items were the most difficult for each group. Limitations measured by the MPAI-4 in these application skills, which are needed to live independently, validate placement in residential programs providing various levels of 24 hour support and assistance.

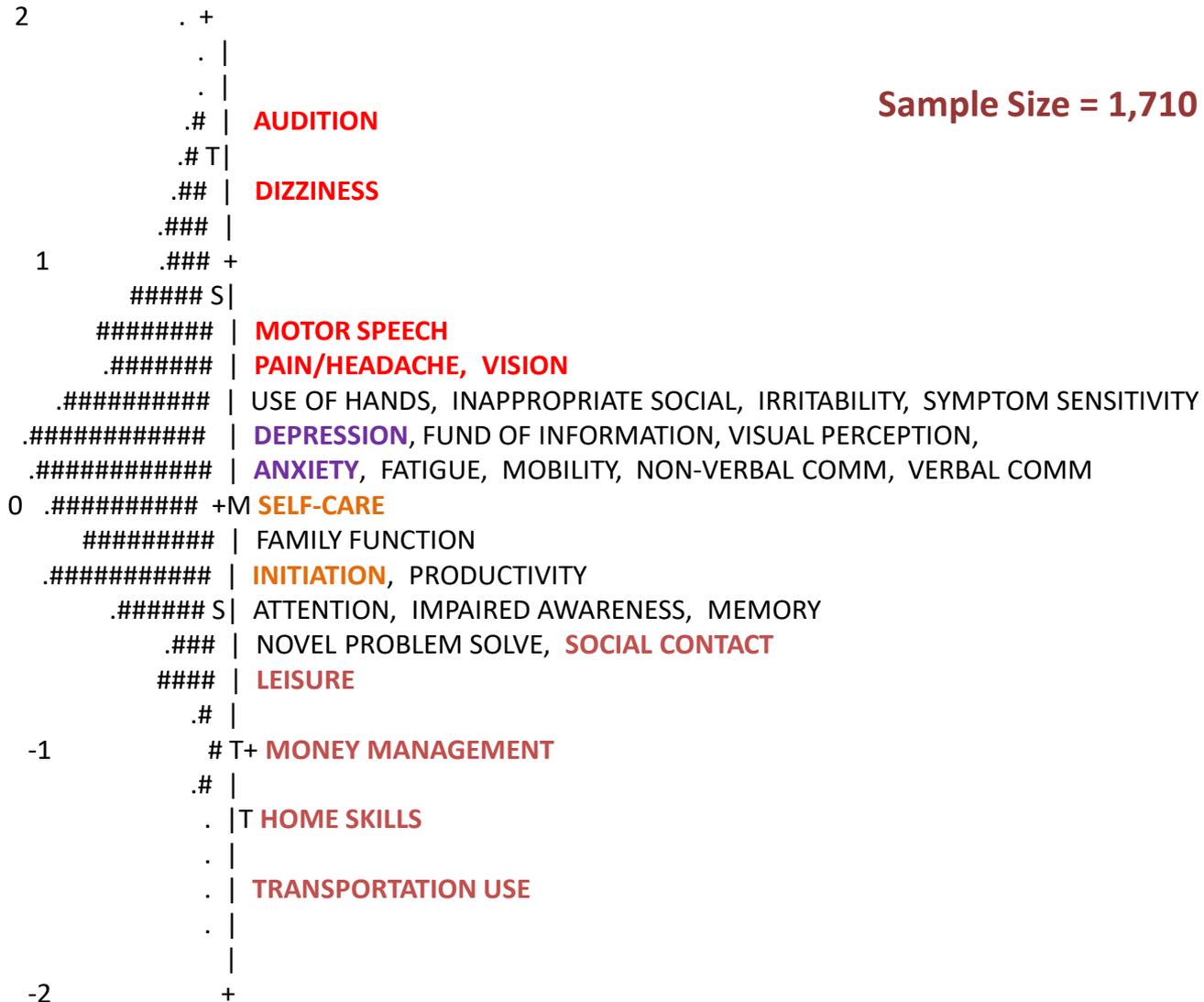
Results of Rasch

Results: The use of the MPAI-4 with the current sample *provided high person reliability (.90) and excellent item reliability (1.00)*. This sample provided similar statistical findings to the original work by Malec & Lezak (2008), but in a post-hospital residential sample providing additional evidence of core construct of outcome after acquired brain injury.

Translation: A *clinical model of care* was developed from this analysis to **prioritize** therapeutic interventions. The model produced provides a new approach to rehabilitation for those with acquired neurological impairments.

Results of Rasch

Sample Size = 1,710 persons



Part IV

Quality Care

Providing an Individualized Approach...

Person Specific and not Time Dependent

New Evidenced Based Model

High Impact/Low Probability Barriers

**Medium Impact / Medium Probability
Barriers**

**Integrated Treatment – Remediation &
Compensation**

Skills Application Phase – I-ADLs

New Evidenced Based Model – Phase A

High Impact/Low Probability Barriers

Audition, Dizziness, Motor Speech, Pain/Headache, Vision, and Hands

In this first level of care, the focus is on symptom management with reduction. These symptoms are considered “high impact - low probability”. This means that they are not likely to occur based on the model findings. However, when they are present, any of these symptoms are likely to create a significant functional impairment (e.g., disruption) causing greater dysfunction, and likely a longer length of stay than the overall impact of the injury alone.

In particular, the symptoms of Audition (hearing impairment) and Dizziness have the highest impact on rehabilitation outcomes.

| New Evidenced Based Model – Phase A

High Impact/Low Probability Barriers

Audition, Dizziness, Motor Speech, Pain/Headache, Vision, and Hands

Therefore, the team that assesses the individual for rehabilitation goal setting would conclude that this is the first level of deficit to address.

By addressing these concerns (if they exist), then other concerns are secondary until either the dysfunction is remediated or compensatory strategy use is well underway.

Goal: Focus for ALL Therapies: remediate with compensatory strategy use until this level can reduce to a mild level of functional impact (e.g., <25% of the time the limitation is present).

New Evidenced Based Model – Phase B

Medium Impact / Medium Probability Barriers

Inappropriate Social Awareness, Irritability, and Sensitivity to Symptoms

In this second level, the focus is based on neurobehavioral concerns. Research by Lewis and Horn (2014) revealed that behavioral impairments have a substantial impact upon recovery. In fact, the impact can cause 2-3xs increased length of stay within a similar sample.

Further, a neurobehavioral profile was developed that significantly separated those with behavioral impairments from those with greater neurorehabilitation needs without significant behavioral disturbances.

| New Evidenced Based Model – Phase B

Medium Impact / Medium Probability Barriers

Inappropriate Social Awareness, Irritability, and Sensitivity to Symptoms

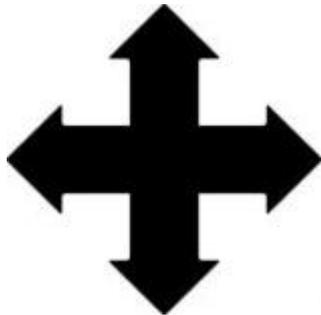
By addressing these concerns as proactively as possible, then the largest level of care can remain on target for successful discharge.

Goal: Focus for ALL Therapies: remediate with compensatory strategy use until this level can reduce to a mild level of functional impact (e.g., <25% of the time the limitation is present).

New Evidenced Based Model – Phase C

Integrated treatment – Multifocal Remediation & Compensation

DEPRESSION, *FUND OF INFORMATION, VISUAL PERCEPTION,*
ANXIETY, *FATIGUE, MOBILITY, NON-VERBAL COMM, VERBAL
COMM*



SELF-CARE

FAMILY FUNCTION

INITIATION, *PRODUCTIVITY*

ATTENTION, IMPAIRED AWARENESS, MEMORY

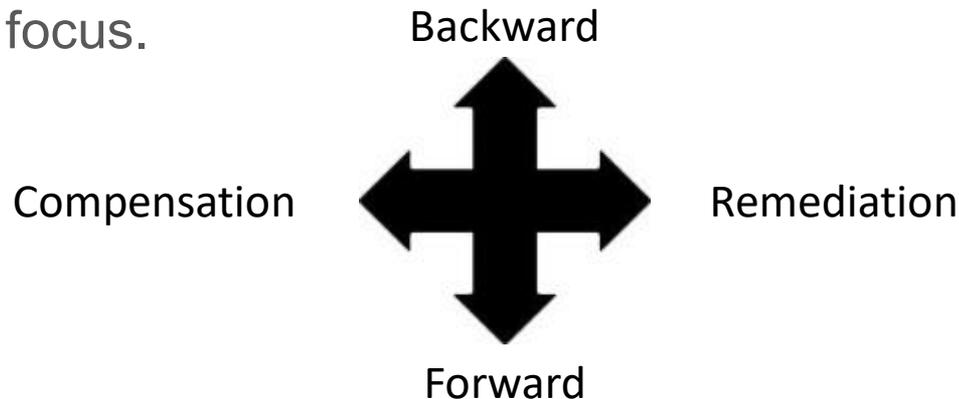
NOVEL PROBLEM SOLVE, SOCIAL CONTACT

These variables are goals that move toward improvement, rather than being seen as barriers to recovery. The only exceptions are **depression** and **anxiety** – both have been found to reduce the total gains made in treatment (Lewis & Horn, 2016).

New Evidenced Based Model – Phase C

Integrated treatment – Multifocal Remediation & Compensation

By addressing these concerns using the same methodology as noted in Phase A (e.g., treat in order of levels), then successful outcomes can be achieved. The goal is that multiple disciplines integrate the rehabilitation focus.



Goal: Focus for ALL Therapies: remediate with compensatory strategy use until this level can reduce to a mild level of functional impact (e.g., <25% of the time the limitation is present).

New Evidenced Based Model – Phase D

Skills Application Phase

Leisure, Money Management, Home Skills, and Transportation Use

This phase is based on the construct of Instrumental Activities of Daily Living.

These are the skills that tend to be resistant to change, which is one of the reasons why the prior levels must be either underway or achieved to make a significant change in this phase.

In addition, self-care and initiation, both factor into this phase of community success (Lewis & Horn, 2015).

| Discussion

Conclusions

The current results conclude that the MPAI-4 provides an excellent method of assessing disability in various neurological samples.

Aside from external validation for the original MPAI-4 Rasch Analysis (2008), this analysis also assisted in developing a pathway to care which focuses rehabilitation interventions.

The refinement of the approach may lead to improved outcomes and reduced length of stay at each level of care. Each level and phase of care can flexibly adapt by using remediation and compensatory strategy development as a person progresses in treatment. The goal is to have deficits continuously addressed until a deficit falls in the mild range of impairment.

References

- Bond, T.G. & Fox, C.M. (2001) Applying the Rasch Model: Fundamental Measurement in the Human Sciences. Lawrence Erlbaum Assoc.: New Jersey.
- Horn, G.J. & Lewis, F.D. (2014). A model of care for neurological rehabilitation. AANLCP – Journal of Nurse Life Care Planning, 14(3), 681-691.
- Lewis, F.D. & Horn, G.J. (2015). Neurologic Continuum of Care: Evidenced-based model of post-hospital system of care. NeuroRehabilitation, 36, 243-251.
- Lewis, F.D. & Horn, G.J. (2016). Depression Following Traumatic Brain Injury: Impact on Post-Hospital Residential Rehabilitation Outcomes (submitted to Neuro-Rehabilitation).
- Malec, J.F. & Lezak, M.D. (2008). Manual for the Mayo-Portland Adaptability Inventory for Adults, Children, and Adolescents.
- Malec J.F., Kragness, M., Evans, R.W., Finlay, K.L., Kent, A., & Lezak, M.D. (2003). Journal of Head Trauma Rehabilitation, 18(6): 479-92.
- www.hopkinsmedicine.org (2016).

References

- Bond T, Fox C. (2007). Applying the Rasch Model: Fundamental Measurement in the Human Sciences (2nd Ed.). Mahwah, NJ: LEA.
- Grimby, G., Tennant, A. & Tesio, L. (2012). The use of raw scores from ordinal scales: time to end malpractice? *Journal of Rehabilitation Medicine*, 44(2), 97.
- Malec JF, Hammond FM, Giacino JT, Whyte J, Wright J. (2012). A structured interview to improve the reliability and psychometric integrity of the Disability Rating Scale. *Archives of Physical Medicine and Rehabilitation*, 93, 1603-8.
- Malec, J.F. & Lezak, M.D. (2008). *Manual for the Mayo-Portland Adaptability Inventory (MPAI-4) for adults, children, and adolescents*. Santa Clara, CA: The Center for Outcome Measurement in Brain Injury.
- Merbitz, C., Morris, J., & Grip, J.C. (1989). Ordinal scales and foundations of misinference. *Archives of Physical Medicine and Rehabilitation*, 70(4), 308-312.
- Tesio, L. (2003). Measuring behaviours and perceptions: Rasch analysis as a tool for rehabilitation research . *Journal of Rehabilitation Medicine*, 35, 105–115.