Mayo Portland Adaptability Inventory-4
National Training Program 2019

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National Analytics & Outcomes

Continuing Education for Rehabilitation Professionals

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

The Mayo Portland Adaptability Inventory – 4 (MPAI-4) training system is part of an ongoing educational series for life skills trainers, professional services, and administrative personnel to better serve and meet the needs of our participants. This program is evidenced based and provides national outcomes benchmarks.

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

Participant Objectives ….

- To get your credits in the least painful way possible!

- To get off this call before you are old enough to retire!

- If food were served, then
  you would give us a
  better rating!

Course Objectives (The real ones..)

- Participants will understand the differences between the use of the Functional Independence Measure (FIM) and the MPAI-4
  - When to use FIM
  - When to use the MPAI
- Participants will learn about the Mayo Portland Adaptability Inventory – 4.
  - Reasons to use the MPAI-4
  - Reasons not to use the MPAI-4
- Participants will understand the use of the MPAI-4 items, and how to transition from assessment to treatment
- Participants will review some of the recent research of the MPAI-4 regarding reliability, validity, patient groups, program groups, aging, and chronicity effects on outcomes

FIM vs. Mayo Portland

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

- 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

The Mayo Portland Adaptability Inventory

Version 4 (2008)

Jim Malec, Ph.D., ABPP
Muriel Lezak, Ph.D., ABPP

Malec J.F. & Lezak M.D. (2008). The Mayo-Portland Adaptability Inventory (MPAI-4) for adults, children and adolescents. Manual; 1-84.

Introduction

Reasons for the MPAI-4

- Clinically evaluate persons during post-acute care following ABI (Acquired Brain Injury)

- Evaluate rehabilitation programs

- Better understanding of the long-term needs of those with acquired brain injury

NeuroRestorative is using the MPAI to...

- Measures outcomes for ABI

- Modify programs based on outcome data

- Provide an outcome measure that compares to the national standards for CARF Accreditation.

Impact of the Mayo Portland

- CARF Accreditation is relying on the use of measures like the Mayo Portland to provide outcome data to produce and add to national standards. The Mayo Portland is a nationally and internationally accepted standard.

- Insurance companies, government agencies, and private payers rely on facilities to use outcome data to self-evaluate program success. Payers are beginning to require this type of analysis to show evidence-based practice for payment.

- Use of this measure provides a national standard that is endorsed by many of the associations for brain injury around the country.

Levels of Impairment – Total Sample

Total (N = 2,606)

|	Abilities	Adjustment	Participation
■ Total Admission	54.65	56.44	54.73
■ Total Discharge	48.33	50.1	48.6
■ Total Gains	6.32	6.33	6.12
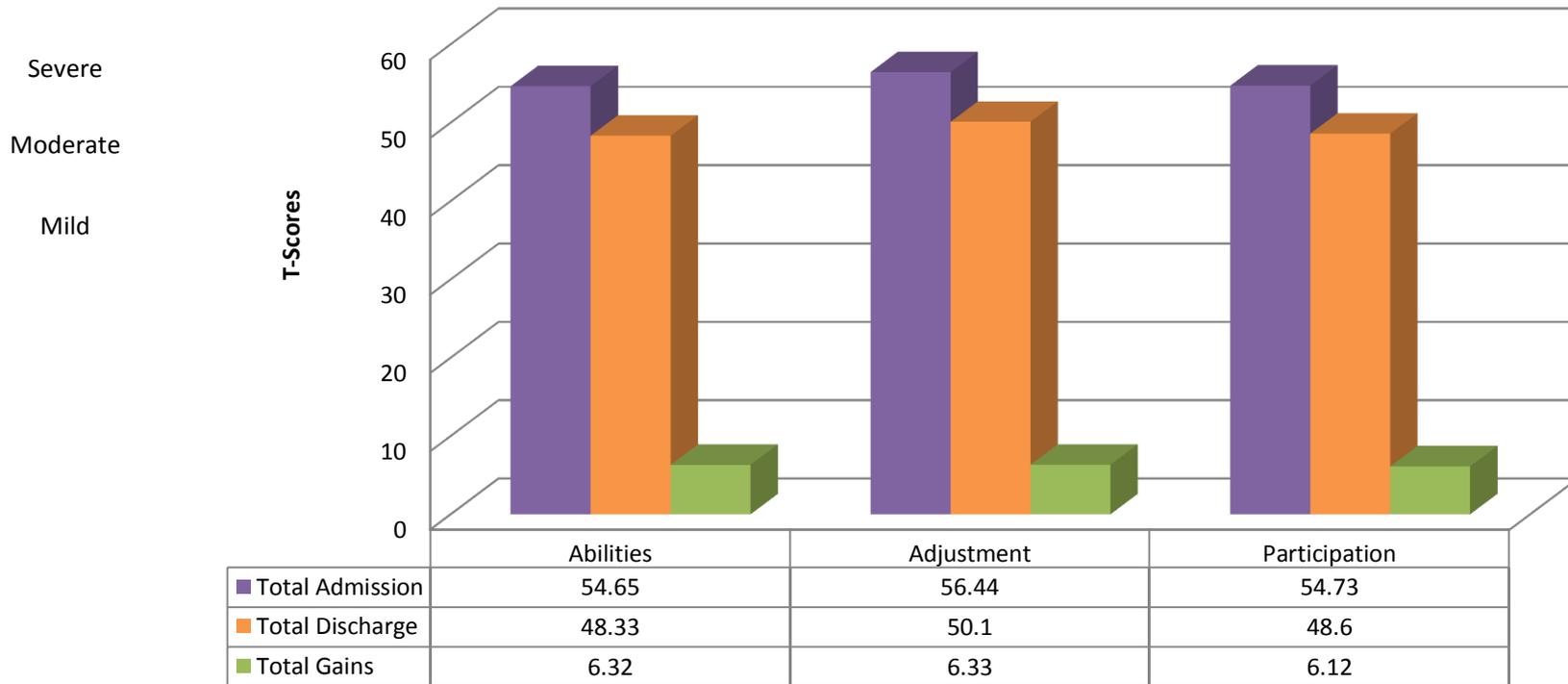
Most enter our programs **moderate to severely impaired**, and it takes an average up to 3.45 years to receive post-hospital services (2018 data).

Levels of Impairment – Total Sample

Neurorehabilitation (N = 1,508)

Severe

Moderate

Mild

	Abilities	Adjustment	Participation
Neurorehabilitation Admission	56.47	57.27	56.02
Neurorehabilitation Discharge	49.2	50.14	48.93
Neurorehabilitation Gains	7.26	7.12	7.08
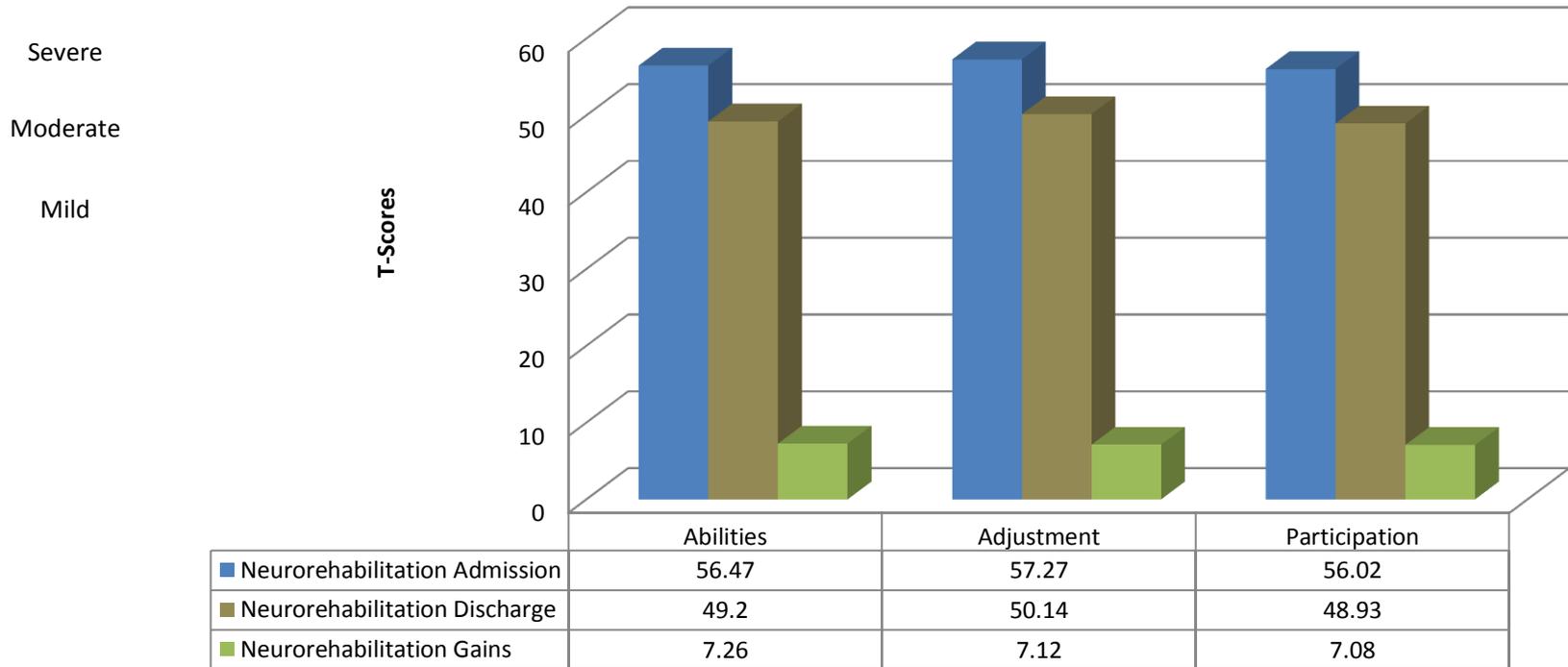
Most enter our programs ranging from mild-moderate to severe. The typical chronicity length is 1.8 years from the time of injury to receiving our services (2018 data).

MPAI-4 Subscales

- 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)

Types of Users

- The measure can be completed by the **person served, their significant other, medical and/or rehabilitation professionals,** and others designated who may know the individual well.

- Scoring and interpretation is not part of training and is completed by a subcommittee within NeuroRestorative.

- The scale is designed to evaluate **adults, adolescents, and children.**

- The Scale <u>is not </u>designed for those below…

Importance of completing the forms

- Reliable data (follow scoring rules) can be used to make predictions, increase positive outcomes, monitor program success, and monitor the actual problems encountered in this area of clinical intervention.

- STOP… NO MISSING DATA

- The data must be completed in a TIMELY manner. We complete the form within 30 days of admission and at the time of discharge. If a person is with us longer than a year, then we do a yearly Mayo Portland until the participant is discharged.

Scoring Levels Review

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

0 = <u>no problems</u>; no adaptive devices are used

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

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

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

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

Mayo Portland

Individual Items

Mayo Portland

Abilities

Physical, Cognitive, Communication

Abilities (Physical, Communication, Cognition)

Mobility (01): walking
- moving, balance

Use of Hands (02): strength or coordination in one or both hands

Vision (03): problems seeing; double vision; visual field deficits

High Impact

Audition (04): problems hearing, ringing in the ears

Dizziness (05): feeling unsteady, lightheaded, or dizzy

Abilities (Physical, Communication, Cognition)

Motor Speech (06): articulation, phonation, rate of speech

Verbal Communication (07-A): problems expressing /comprehending

Non-Verbal Communication (07-B): problems expressing thoughts through gestures, facial expression, or other non-language behaviors or understanding such expressions from others

Abilities (Physical, Communication, Cognition)

- *Attention/Concentration (08):* problems ignoring distractions; difficulty shifting attention

- *Memory (09):* problems learning and recalling new information

- *Fund of Information (10):* information learned in school or on the job or general knowledge

- *Novel Problem Solving (11):* problems generating
      solutions or picking the best solutions

- *Visual-Spatial Abilities (12):* problems drawing,
      assembling things together, being visually
      aware of both the left and right sides

Adjustment (Mood, Behavior, Social)

Anxiety (13): tense, nervous, fearful, phobic, symptoms of post-traumatic stress disorder such as nightmares, flashbacks of stressful events.

Depression (14): Sad, blue, hopeless, poor appetite, poor sleep, worry, self-criticism.

Research has demonstrated that both depression and anxiety can have an adverse effect on outcomes in post-hospital rehabilitation.

Adjustment (Mood, Behavior, Social)

Irritability, Anger, Aggression (15):

verbal or physical expressions of anger.

Pain and Headache(s) (16): pain complaints and behaviors; if pain originates from multiple body areas (head, back), then rate overall impact.

Fatigue (17): feeling tired, low in energy; fatigability, that is, feeling low in mental or physical energy after a relatively low level of mental or physical activity; fatigue may be a symptom of depression and should not be rated here.

Sensitivity to Mild Symptoms (18): focusing on post-traumatic cognitive, physical, or emotional problems; this rating is based on how distressed or concerned the individual is about their functioning.

Adjustment (Mood, Behavior, Social)

Inappropriate Social Interaction (19): acting childish, silly, rude; behavior not consistently fitting to the time and place or age-appropriate.

Impaired Self-Awareness (20): lack of recognition of personal limitations and disabilities and how they interfere with everyday activities, work or school.

Family/Significant Relationships (21): interactions with close others; describes stress within the family or those closest to the person with brain injury.

Participation (Initiation, Community Skills)

Initiation (22): problems getting started on activities without prompting

Social contact with friends, work associates, and other people who are not family, significant others or professionals (23): the frequency of contacts and consistency of relationships with people who are not related to or have a professional relationship with the person with brain injury

Leisure and Recreational Activities (24): involvement in hobbies, sports, and other active and passive activities primarily for enjoyment either alone or with others

Participation (Initiation, Community Skills)

Self-Care (25): involves eating, dressing, bathing, and hygiene; this considers the amount of independence with which basic self-care activities are performed

Residence (26): responsibilities of independent living and homemaking (such as meal prep, home repairs and maintenance), medication management, and personal health maintenance beyond basic hygiene

Transportation (27): independence in moving oneself outside of the home in the community; in rating this item, consider ability to perform these activities without assistance as well as environmental limitations

Participation (Initiation, Community Skills)

Paid Employment (28-A): work for pay; you can only rate on 28-A or 28-B; an unemployed person that is looking for employment is rated on 28-A, but if that person were returning to school or homemaking, then they are rated on 28-B.

Other Employment (28-B): unpaid work, such as, formal schooling, volunteer work, homemaking, and retirement for those over age 60.

Managing Money/Finance (29): shopping, keeping a checkbook or other bank account, managing personal income and investments

Pre-Existing Conditions

- <u>Alcohol:</u> use of alcoholic beverages
  both before and after injury
- <u>Drug Use:</u> use of illegal drugs or abuse
  of prescription drugs both before
  and after injury

- <u>Psychotic Symptoms:</u> hallucinations, delusions, other severe distortions of reality
- <u>Law Violations:</u> pre-injury or post-injury history of conviction for legal infractions
  0 = no problems; no history
  1 = conviction for no more than 2 misdemeanors
  2 = conviction for more than 2 misdemeanors
  3 = a single felony conviction
  4 = multiple felony convictions

Other Conditions (Physical and Cognitive)

- Other Conditions causing **Physical Impairments**:
  - physical effects of other conditions that were present prior to brain injury, resulted from non-brain injuries, or occurred after the injury
  - Examples: spinal cord, amputation, diseases other than the brain

- Other Conditions causing **Cognitive Impairments**:
  - cognitive effects of other conditions that were present prior to brain injury, resulted from non-brain injuries, or occurred after the injury
  - Examples: Dementia, Alzheimer's Disease, stroke, anoxia

Mayo Portland Clinical Application

Clinical Application of the MPAI-4

- The following charts show how the Mayo Portland is also being used in selected programs to help the treatment team assess needs and set goals of participants in the first 30 days of admission.

- The charts are placed into the three categories: abilities, adjustment, and participation.

- The **blue** and **red** indicate admission and discharge scores. The **green** is a new participant's rating on the MPAI upon admission. We then take their scores and overlay them on the national average scores for that person's program.

- For example, if the person is in active rehabilitation, then the new participant is compared to our national sample of active rehabilitation. This allows for comparisons and creating projected discharge goals for any program in NeuroRestorative.

Review the Dashboard – Provide a case.

Clinical Application - Abilities

MPAI-4 Neurorehabilitation Ability Indices

	Mobility	Use of Hands	Vision	Audition	Dizziness	Motor Speech	Verb Comm	Non-Verb Comm	Attention	Memory	Fund of Infor	Prob Solve	Visual-Spatial
Admission	2.22	1.81	1.74	0.57	0.97	1.25	1.90	1.92	2.59	2.80	1.65	2.76	2.01
Discharge	1.45	1.26	1.24	0.42	0.51	0.98	1.36	1.40	2.04	2.13	1.27	2.20	1.38
Current	3.00	3.00	4.00	0.00	0.00	1.00	3.00	3.00	4.00	4.00	4.00	4.00	4.00
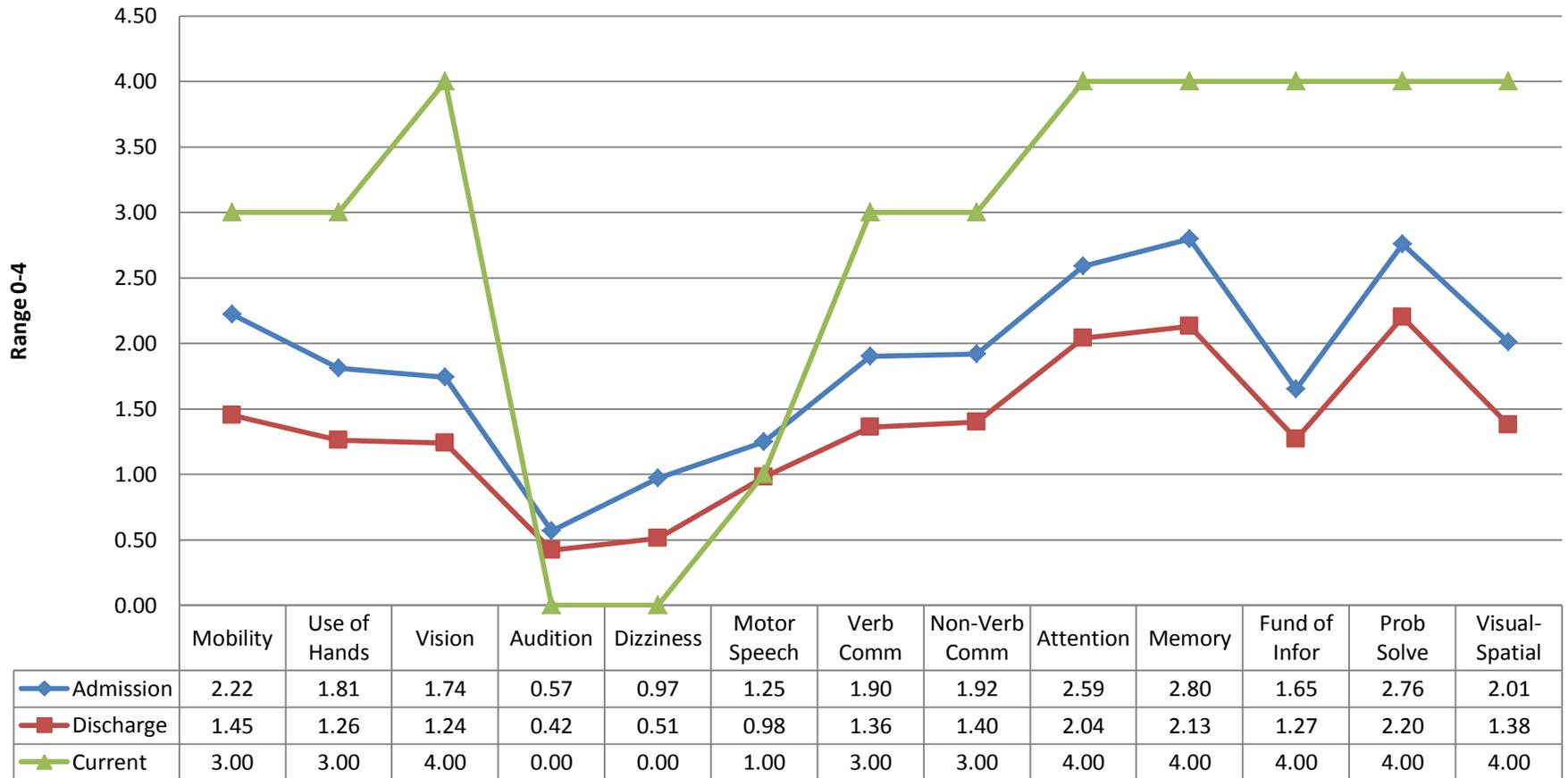
Clinical Application - Adjustment

MPAI-4 Neurorehabilitation Adjustment Indices

	Anxiety	Depression	Irritability	Pain Headache	Fatigue	Sx Sensitivity	Inapp Social	Self-awareness	Family Relation
Admission	2.06	1.78	1.77	1.64	2.13	1.57	1.6	2.69	2.51
Discharge	1.51	1.31	1.32	1.12	1.42	1.17	1.28	2.08	2.25
Current	3.00	1.00	2.00	3.00	3.00	2.00	0.00	3.00	4.00
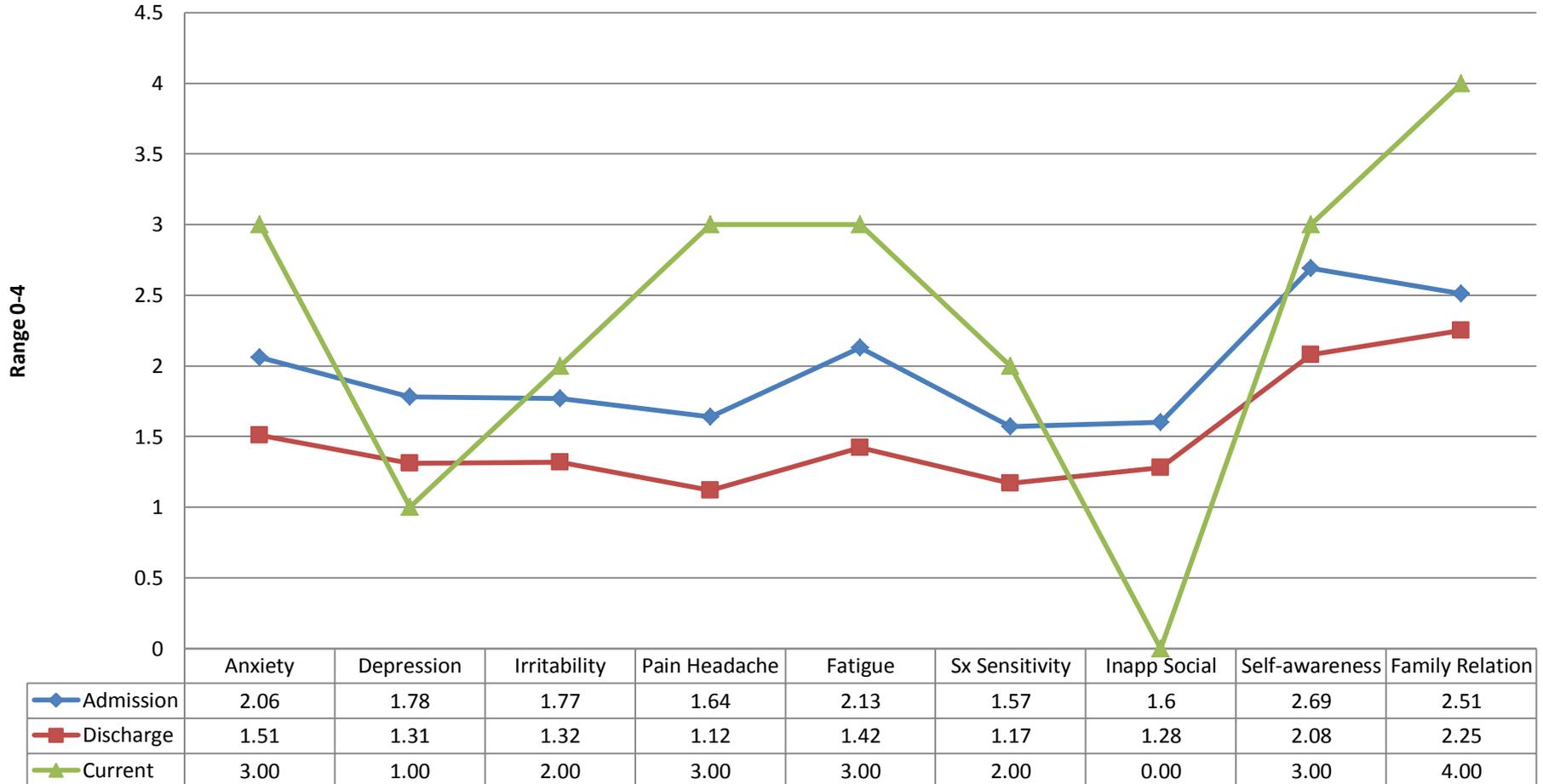
Clinical Application - Participation

MPAI-4 Neurorehabilitation Participation Indices

	Initiation	Social Contact	Leisure/Rec	Self-care	Residence	Transport	Paid Emply	Other Emply	Money Manage
Admission	2.52	2.85	2.96	2.22	3.36	3.65	3.52	3.51	3.26
Discharge	1.9	2.21	2.18	1.4	2.15	3.12	3.17	3.08	2.66
Current	4.00	4.00	4.00	1.00	4.00	4.00	4.00		4.00
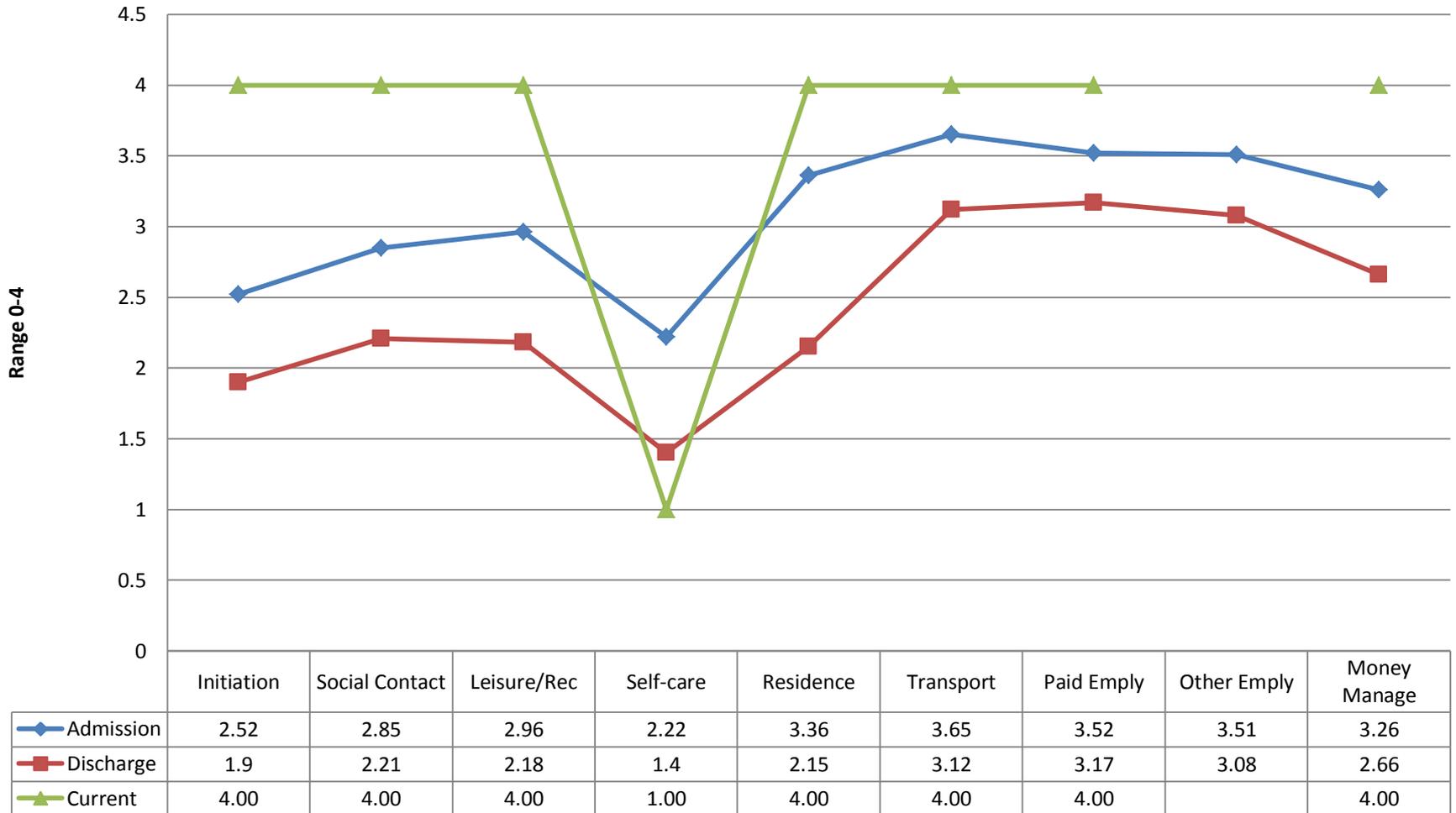
Mayo Portland Research

Mayo Portland Research Samples

- **Mayo Sample (2003, N = 123)**
  - Males/females = 61%/39%
  - Average age = 38 years
  - Time since Injury = 5.3 years
  - Type of injury = TBI (65%), CVA (15%), Other (20%)
  - Severity: Mild (29%), Moderate (12%), Severe (44%)
- **National Sample (2008, N = 386)**
  - Males/females = 73%/27%
  - Average age = 38 years
  - Time since Injury = 6.9 years
  - Type of injury = TBI (88%), CVA (6%), Other (6%)
  - Severity: Mild (5%), Moderate (29%), Severe (39%)
- **NeuroRestorative Sample (2019, N = 3,254)**
  - Males/females = 74%/26%
  - Average age = 45.2 years
  - Time since Injury = 3 years
  - Type of injury = TBI (64%), CVA (12.5%), Anoxic 5%), Tumor (2%), Medical (5%), SCI (10%)
  - Severity: Mild = 17%; Moderate = 42%, Severe = 41%

Mayo Portland Research

Various Statistical Methods are being used in the literature to show efficacy, reliability, validity and application.

NeuroRestorative uses the following statistical analyses:

1. Multiple Analysis of Variance

2. Multiple Regression

3. Quartile Analyses for performance

4. Rasch Analysis for reliability, validity, and modeling

NeuroRestorative has developed a model of rehabilitation care using the Mayo Portland scale.

Completed Research 2013

Horn, GJ & Lewis, FD (2013). Analysis of Post-Hospital Neurological Rehabilitation Outcomes (abstract). *The Journal of Head Trauma Rehabilitation, 28(5)*, 25 (#0057).

Horn. G.J. & Lewis, F.D. (2013). Analysis of post-hospital neurological rehabilitation outcomes. Paper presented to the *North American Brain Injury Society (NABIS) Annual Meeting*, September 20, 2013 - Technology Lecture Series.

Lewis, F.D. & Horn, G.J. (2013). Functional impact of depression on traumatic brain injury outcomes. Presented at the *Special Operations Medicine Conference*, Tampa, FL.

Lewis, F.D. & Horn, G.J. (2013). Traumatic Brain Injury: Analysis of functional deficits and post-hospital rehabilitation outcomes. *Journal of Special Operations Medicine, 13 (3)*, 56-61.

Completed Research 2014-2015

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.

Horn, G.J., Lewis, F.D., Russell, R., & Harding, V. (2014). Pediatric Neurorehabilitation: post-hospital outcome comparisons. Accepted by the *World Congress 2014*.

Horn, G.J. & Lewis, F.D. (2014). Functional impact of anxiety on traumatic brain injury outcomes. Presented at the 91st American Congress of Rehabilitation Medicine, October 2014, Toronto, Canada. Published abstract in the *Archives of Physical Medicine & Rehabilitation*.

Lewis, F.D. & Horn, G.J. (2014). Post-hospital Brain Injury Rehabilitation: Comparison of neurobehavioral intensity and neurorehabilitation outcomes. Presented at the 91st American Congress of Rehabilitation Medicine, October 2014, Toronto, Canada. Published abstract in the *Archives of Physical Medicine & Rehabilitation*.

Russell, R., Horn, G.J., Lewis, F.D. & Harding, V. (2014). Pediatric Neurorehabilitation: post-hospital outcome comparisons. Paper presented at *2014 Research Symposium for Master's in Public Health*, Benedictine University, College of Education and Health Services, Lisle, IL.

Lewis, F.D. & Horn, G.J. (2015). Neurologic Continuum of Care: Evidence-based Model of Post-hospital System of Care. *Neurorehabilitation* (Accepted January 19, 2015; Spring, 2015 release).

Completed Research 2016-2017

Horn, GJ, Lewis, FD & Malec, JF (2016). Rehabilitation Modeling: Using the Rasch Analysis for evidenced-based care, *Archives of Physical Medicine and Rehabilitation. (Presented at the American Congress of Rehabilitation Medicine – Chicago, Illinois).*

Horn, GJ, Lewis, FD & Pipetone, J (2017). Clinical challenges of craniopharyngioma: Neurobehavioral sequelae and complex outcomes. *Neurologic Disorders and Therapeutics, 1(2),* 1-5.

Lewis, FD, Horn, GJ & Russell, R. (2017). Examination of Post-Hospital Residential Brain Injury Rehabilitation Outcomes Across the Age Spectrum. *International Journal of Physical Medicine & Rehabilitation, 5(1),* 1-6.

Lewis, FD, Horn, GJ & Russell, R. (2017). Impact of Chronicity on Outcomes Following Post-Hospital Residential Brain Injury Rehabilitation: Application of Multivariate Statistics and Rasch Analysis. *Open Journal of Statistics, 7,* 254-263.

Lewis, FD & Horn, GJ (2017). Depression following traumatic brain injury: Impact on post-hospital residential rehabilitation outcomes. *NeuroRehabilitation, 40,* 401–410.

Malec, JF & Keene, J (2016). Post-Inpatient Brain Injury Rehabilitation Outcomes: Report from the National OutcomeInfo Database. *Journal of Neurotrauma,* 33, 1371–1379.

Almost Done!

Conclusions

- The Mayo Portland allows post-hospital centers to meet the CARF standard for Effectiveness and measurement of outcomes. This means the MPAI shows how we are able to reduce a participants disability based on abilities, adjustment, and participation.

- The Mayo Portland is accepted internationally and nationally.

- NeuroRestorative is doing research on post-hospital care rehabilitation and outcomes.

- The Mayo Portland is a standardized measure with proven reliability and validity.

- Research is demonstrating efficacy of treatment using a post-hospital model of care from the residential level to the outpatient, and home and community levels.

- Chronicity is the largest predictor of potential gains made at each level of care.

That was easy… Any questions?

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Neuro
Restorative™
Rebuilding Lives After Brain Injury

All Done!