



**DEFENSE CENTERS
OF EXCELLENCE**

For Psychological Health
& Traumatic Brain Injury

Translational NeuroRehabilitation Outcomes: Research Trends and Person-Centered Care

June 11, 2015, 1-2:30 p.m. (ET)

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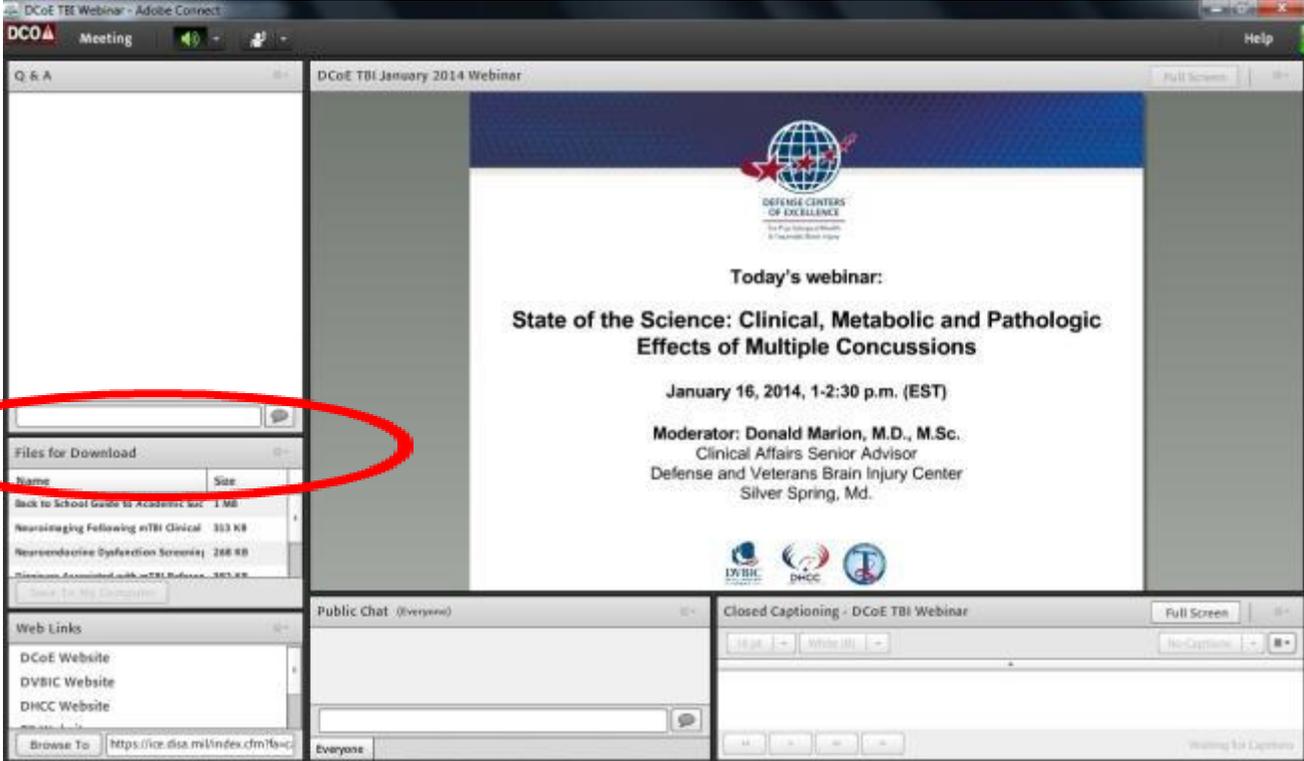


Webinar Details

- Live closed captioning is available through Federal Relay Conference Captioning (see the “Closed Captioning” box)
- Webinar audio is **not** provided through Adobe Connect or Defense Connect Online
 - Dial: CONUS **888-455-0936**; International **312-470-7430**
 - Use participant pass code: **9942561**
- Question-and-answer (Q&A) session
 - Submit questions via the Q&A box

Resources Available for Download

Today's presentation and resources are available for download in the "Files" box on the screen, or visit dvbic.dcoe.mil/online-education



The screenshot displays a webinar interface with several panels. The main content area shows the webinar title: "State of the Science: Clinical, Metabolic and Pathologic Effects of Multiple Concussions" for January 16, 2014, moderated by Donald Marion, M.D., M.Sc. A "Files for Download" panel on the left is circled in red, containing a table of resources:

Name	Size
Back to School Guide for Academics.doc	1 MB
Neuroimaging Following mTBI Clinical	353 KB
Neuroendocrine Dysfunction Screens	266 KB
Diagnosis Associated with mTBI Referral	303 KB

Below the table is a "Web Links" section with links to DCoE, DVBIC, and DHCC websites, and a "Public Chat" area at the bottom.

Continuing Education Details

- DCoE's awarding of continuing education (CE) credit is limited in scope to health care providers who actively provide psychological health and traumatic brain injury care to active-duty U.S. service members, reservists, National Guardsmen, military veterans and/or their families.
- The authority for training of contractors is at the discretion of the chief contracting official.
 - Currently, only those contractors with scope of work or with commensurate contract language are permitted in this training.

Continuing Education Accreditation

- This continuing education activity is provided through collaboration between DCoE and Professional Education Services Group (PESG).
- Credit Designations include:
 - 1.5 AMA PRA Category 1 credits
 - 1.5 ACCME Non Physician CME credits
 - 1.5 ANCC nursing contact hours
 - 1.5 APA Division 22 contact hours
 - 1.5 CRCC contact hours
 - 0.15 ASHA credits

Continuing Education Accreditation

Physicians

This activity has been planned and implemented in accordance with the essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME). Professional Education Services Group is accredited by the ACCME as a provider of continuing medical education for physicians. This activity has been approved for a maximum of 1.5 hours of *AMA PRA Category 1 Credits*[™]. Physicians should only claim credit to the extent of their participation.

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Occupational Therapists

(ACCME Non Physician CME Credit) For the purpose of recertification, The National Board for Certification in Occupational Therapy (NBCOT) accepts certificates of participation for educational activities certified for AMA PRA Category 1 Credit[™] from organizations accredited by ACCME. Occupational Therapists may receive a maximum of 1.5 hours for completing this live program.

Physical Therapists

Physical Therapists will be provided a certificate of participation for educational activities certified for AMA PRA Category 1 Credit[™]. Physical Therapists may receive a maximum of 1.5 hours for completing this live program.

Continuing Education Accreditation

Psychologists

This Conference is approved for up to 1.5 hours of continuing education. APA Division 22 (Rehabilitation Psychology) is approved by the American Psychological Association to sponsor continuing education for psychologists. APA Division 22 maintains responsibility for this program and its content.

Rehabilitative Counselors

The Commission on Rehabilitation Counselor Certification (CRCC) has pre-approved this activity for 1.5 clock hours of continuing education credit.

Speech-Language Pathologists

If attending entire event, a total of 0.15 ASHA CEUs may be obtained (Intermediate level, Professional area).

Other Professionals

Other professionals participating in this activity may obtain a General Participation Certificate indicating participation and the number of hours of continuing education credit.

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- If you wish to obtain a CE certificate or a certificate of attendance, please visit <http://dcoe.cds.pesgce.com> after the webinar to complete the online CE evaluation.
- The online CE evaluation will be open through **Thursday, June 25, 2015.**

Questions and Chat

- Throughout the webinar, you are welcome to submit technical or content-related questions via the Q&A pod located on the screen. **Please do not submit technical or content-related questions via the chat pod.**
- The Q&A pod is monitored during the webinar; questions will be forwarded to presenters for response during the Q&A session.
- Participants may chat with one another during the webinar using the chat pod.
- The chat function will remain open 10 minutes after the conclusion of the webinar.

Summary and Learning Objectives

Trauma care and acute care have significantly improved the survival of and reduced disability in individuals who have sustained moderate to severe traumatic brain injury (TBI). However, post-hospital care has been less well defined or validated as an intervention for this population. This webinar addresses research which supports the neurological continuum of care from the neurological intensive care unit through post-hospital care to return home.

Current research substantiates that post-hospital care leads to positive results and ultimately decreases disability in individuals with extensive injury. Statistical analyses such as the Rasch statistical technique have the potential for determining the level of rehabilitation intervention. This technique reveals that Instrumental Activities of Daily Living tend to be the most difficult skills to rehabilitate and those to change last in the skill acquisition continuum. This analysis provides a method to facilitate person-centered care outcomes. For those with fewer resources, this model can be adapted to person-centered therapy in the home.

At the conclusion of this webinar, participants will be able to:

- Articulate how current research trends in post-hospital rehabilitation impact health care decisions
- Discuss outcomes prediction, measuring and monitoring, and cost utilization
- Incorporate the application of the facility-based model to the home and community level for the individual with limited resources

Gordon Horn, Ph.D.



Gordon Horn, Ph.D.

- National Deputy Director of Clinical Outcomes at NeuroRestorative focusing on outcomes, translational research, and healthcare economics in post-hospital rehabilitation
- Research interests include traumatic brain injury (TBI) outcomes, rehabilitation outcomes, and normal pressure hydrocephalus
- Experienced in entire continuum of neurological care from intensive care through post-hospital treatment
- Current academic appointment with Florida State University College of Medicine
- Education: Ph.D, Clinical Psychology, Saint Louis University; internship and post-doctoral fellowship, Duke University School of Medicine, specializing in neuropsychology, medical psychology and neurological rehabilitation



Translational Neurorehabilitation Outcomes: Research Trends and Person-centered Care

Gordon J. Horn, Ph.D.
National Deputy Director of Clinical Outcomes

Disclosures

- The views and opinions expressed in this presentation are those of the presenter and do not represent official policy of the Department of Defense (DoD), the United States Army or DVBIC.
- The NeuroRestorative Outcomes Team (Gordon J. Horn, Ph.D., National Deputy Director of Clinical Outcomes Services; Frank D. Lewis, Ph.D., National Director of Clinical Outcomes Services; Robert B. Russell, BHA, CBIS National Data Analyst) has no financial relationship with any vendor or contractor.
- The presenter does not intend to discuss the off-label/investigative (unapproved) use of commercial products or devices.

Overview

As stated, we will discuss:

- Basic trends and statistics regarding various neurological conditions and needs for post-hospital rehabilitation care.
- Current research trends in post-hospital rehabilitation and how this impacts our healthcare decisions. Prediction, measuring, and monitoring of outcomes and cost utilization.
- How to apply what is learned from the facility-based model to the home and community level for the individual with limited resources.

POLLING QUESTION #1

Select the primary type of health care facility where you practice.

- Military treatment facility
- VA health care facility
- Academic medical center
- Community hospital
- Private practice
- Not applicable

POLLING QUESTION #2

Select the predominant TBI severity level you see in your practice.

- Mild to moderate TBI
- Moderate to severe TBI
- Not applicable

POLLING QUESTION #3

Please indicate your role in TBI rehabilitation.

- Behavioral health provider
- Case manager
- Neurologist
- Occupational therapist
- Optometrist
- Physical medicine and rehabilitation physician
- Physical therapist
- Speech-language pathologist
- Other rehabilitation provider
- Not applicable



Let's get perspective...

How many lives are changed?

TBI Statistics – CDC

Males aged **15-24** and persons older than 65 years of age have the highest incidence of TBI; in most studies and research, 75% are male, 25% are female

In 2010, estimates were 2.5 million persons sustaining a traumatic brain injury.

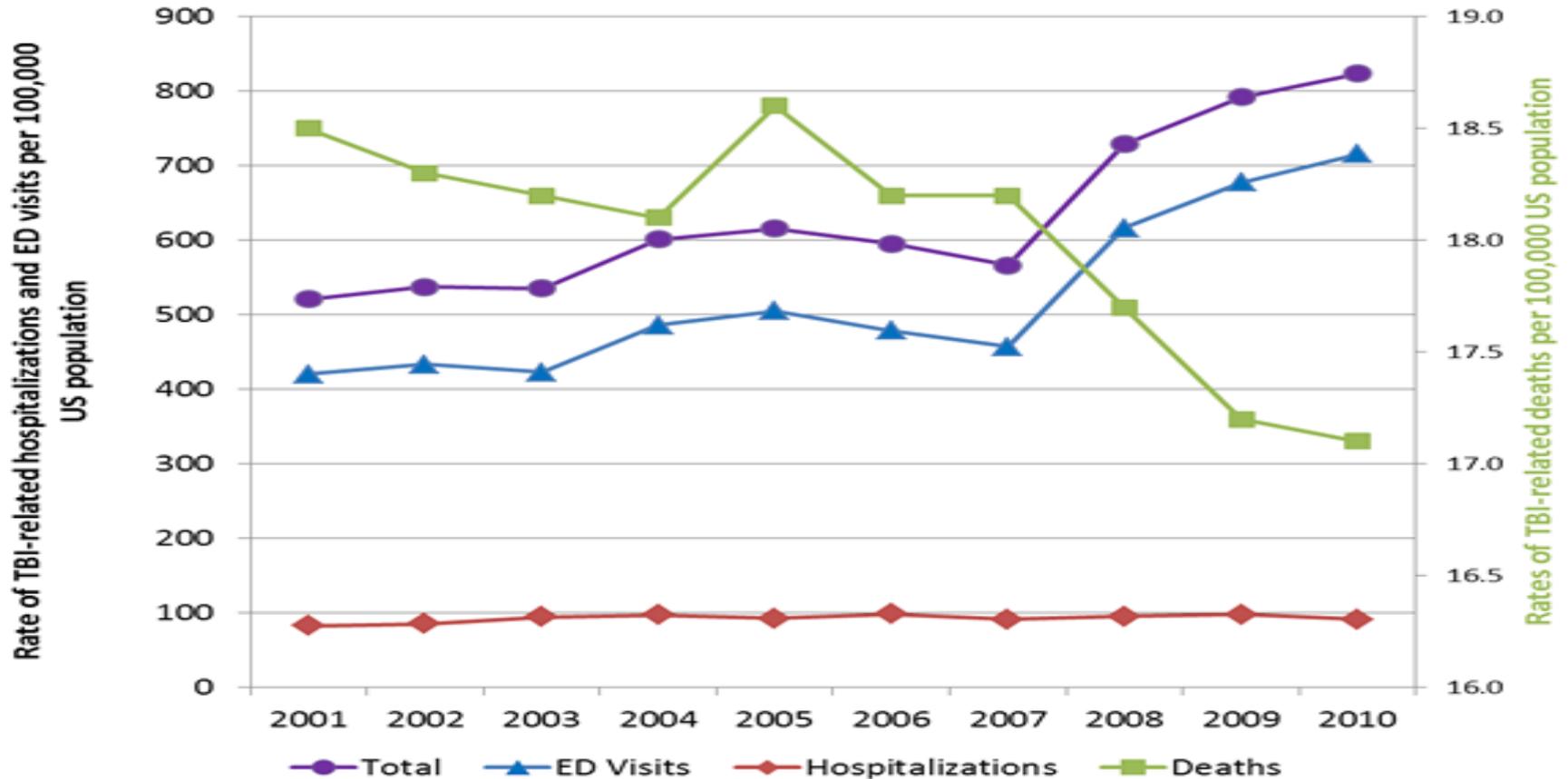
Approximately 5.3 million persons are living with the residual disability effects from their injury. There are approximately 10 million persons worldwide living with residual effects of TBI.

Men have twice the rate of death following TBI than women but both have decreased overall from 2001-2010. Rate for men is 25.4 per 100,000 and women is 9.10 per 100,000.

(http://www.cdc.gov/traumaticbraininjury/get_the_facts.html)

TBI Statistics – CDC

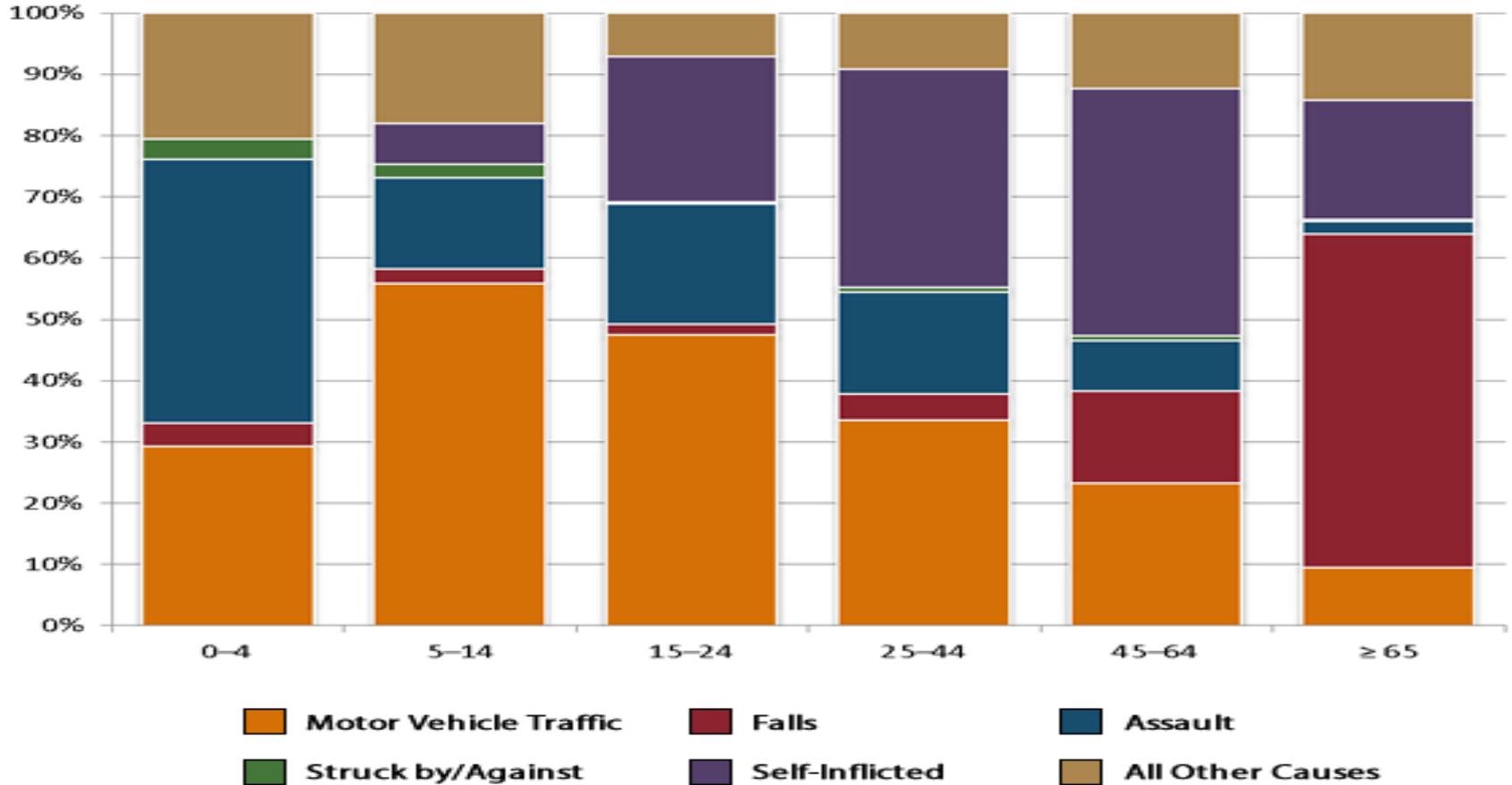
Rates of TBI-related Emergency Department Visits, Hospitalizations, and Deaths — United States, 2001–2010



(<http://www.cdc.gov/traumaticbraininjury/data/rates.html>)

TBI Statistics – CDC

Percent Distributions of TBI-related Deaths by Age Group and Injury Mechanism — United States, 2006–2010



(http://www.cdc.gov/traumaticbraininjury/data/dist_hosp.html)

Clinical Case Examples

Case: **Moderate to Severe Injury – Automobile (MY)**

Age: 18 at time of injury

Gender: Male

Education: Master's Degree (after TBI)

Case: **Severe Injury – Fall (LR)**

Age: 20 at time of injury

Gender: Male

Education: High School

Case: **Moderate to Severe Injury – Pedestrian vs. Truck (SB)**

Age: 25 at time of injury

Gender: Female

Education: College Degree

Vascular Disorder Statistics – CDC

Approximately 800,000 persons suffer a stroke in the United States each year.

This is the fifth leading cause of death. Every four minutes, someone dies from stroke.

The cost associated with strokes totals about \$34 billion per year for care and for lost productivity.

(<http://www.cdc.gov/stroke/facts.html>)

Vascular Disorder Statistics – CDC

Origins... **49%** of Americans have at least 1 of 3 risk factors.

Genetics – Family history

History of prior stroke – Nearly 1 in 4 persons who have a stroke have had a prior stroke.

Congenital (since birth) malformations

Hypertension

Diabetes

High cholesterol

Tobacco use

(<http://www.cdc.gov/stroke/facts.html>)

Vascular Disorders

Case 1: Aneurysm Ruptures

Age: 44

Gender: Female

Education: 2 years of college; BA after TBI

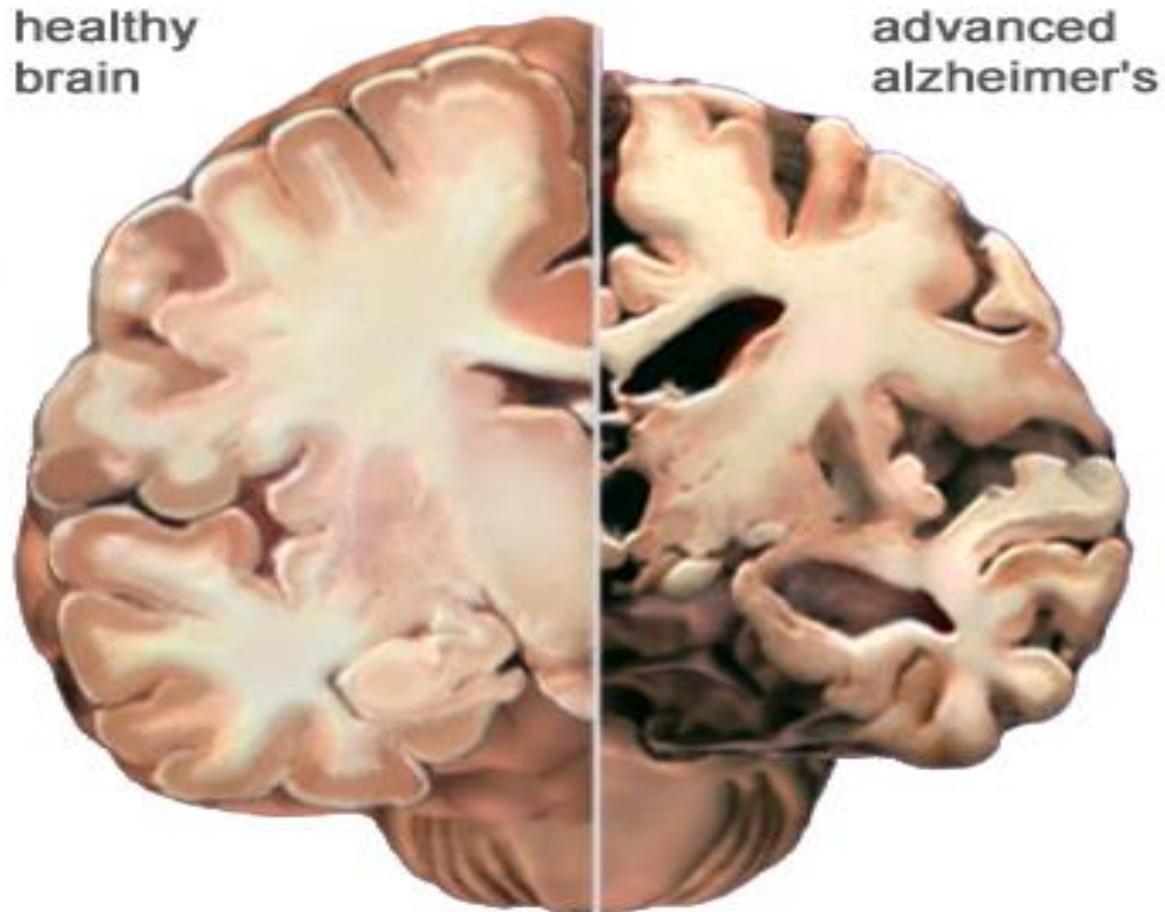
Case 2: Spontaneous Hemorrhage

Age: 56

Gender: Female

Education: High School

Degenerative Conditions – Parkinson’s Disease, Alzheimer’s, Other Dementias



(http://www.alz.org/braintour/healthy_vs_alzheimers.asp)

Dementia Syndromes

... Those aged 65 or greater in the United States will account for 19.6% of the population in 2030.

... The prevalence of dementia has been estimated to be 6-10% of individuals aged 65 and older; prevalence increases with age with 30% or more of those 85 or older.

... Dementia increases the healthcare costs by \$4,134 per older adult with 75% of the increase cost attributed to hospitalization and skilled nursing.

...Reversible – Vitamin deficiency, thyroid dysfunction, idiopathic normal pressure hydrocephalus. This accounts for 9% of the dementias.

...Degenerative – Alzheimer Disease (AD); approximately 75% of individuals with dementia have AD. Other types include frontotemporal dementia, Parkinson's, vascular, mild cognitive impairment, depression.

Brain Tumor Statistics

Total number of new tumors diagnosed yearly in the United States
nearly 70,000

Total number of deaths yearly in the United States due to brain
tumors
nearly 14,000

<http://www.abta.org/about-us/news/brain-tumor-statistics/>
(American Brain Tumor Association, 2015)

Treatment: 20 years ago there was a 3-6 months prognosis for malignant tumors. This rate has since changed but remains highly variable due to various conditions including primary, secondary, non-malignant tumor types, and responses to treatment.

Common Elements Working with Neurological Injuries

- 1) All of the conditions that have been mentioned are located in the **brain and can co-exist**.
- 2) All of the conditions can range from **mild to severe**.
- 3) Any of the conditions/disorders can **afflict anyone at anytime**.
- 4) All of the conditions have short-term and many can have long-term effects that may lead to a **lifetime of challenges**.
- 5) Brain injury includes TBI but also includes many other conditions – **brain injury is diverse** in presentation, affliction, and outcomes.
- 6) If you have seen one brain injury, then you have seen one brain injury.
- 7) **Costs are rising**: United States spends 17.9% of the GDP on healthcare; most other comparable countries spend 11%.
(<http://www.google.com/analytics>)
- 8) We do not need more money... we need to spend it more wisely.



Treatment and Levels of Care

When is care appropriate based on outcomes?

A) Acute Care

1. Hospital
2. Rehabilitation Center

B) Post-Hospital Care

1. Post-hospital Rehabilitation Programs
2. Day Treatment Programs
3. Home and Community Programs
4. Outpatient Centers
5. Home
6. None

On average, up to five months of therapy is completed within the hospital and rehabilitation center (10-20%); the rest is home, community and post-acute (80-90%).

What about Family and Support Systems?

Brain injury is about the societal system, not just the individual.

Can more than one Psychologist or Behavioral Health Provider be involved in a person's care and treatment for better outcomes?

Answer: Yes, but it must be coordinated!

Concept: Just as there are medical specialists such as internists, physician medicine and rehabilitation physicians, and neurologists, there are specialists in psychology.

Model: Neuropsychological rehabilitation includes neuropsychology for the patient, and clinical psychology/counseling for the family with/without the patient.

Examples: Cases and how the mixed approach works.



Outcomes and Research Findings

Research from 2013

This was an explosion year in brain injury research and findings.

Hayden et al., 2013

... first article of 2013 demonstrating in a mixed sample that persons get better after 3-6 months of post-hospital care, and emphasized post-hospital care following the hospital level.

... earlier intervention is better.

... **length of time since injury did not deter outcomes** when using a standard measurement of outcomes.

Research from 2013 and 2014

... Large, multi-center analyses of multiple samples that demonstrated time is only helpful for recovery in the initial 6 months

... After 6 months, recovery is dependent upon what you do – enriched programming

... Neurorehabilitation, Neurobehavioral Intense, and Supported Rehabilitation groups made progress and positive changes resulting in reduced disability and reduced need for supervision

... Age had no significant effects

(Lewis & Horn, 2013)

... Depression was noted in 34% of the samples

... Anxiety was noted in approximately 30% of the samples

... Treat mood and anxiety related disorders for better outcomes

(Chaudhury, Biswas, & Kumar, 2013; Horn & Lewis, 2014; Lewis & Horn, 2013)

Research from 2013

... First study to demonstrate that “enrichment” makes a physical difference on magnet resonance imaging (MRI) of the brain.

... Their research showed that when patients had intervention and enrichment in their day, that they were able to **reduce brain atrophy** compared to those who do not have enrichment.

Example Case Study: LR

... 27 years old

... female

... “hallucinations and delusions”

... medications

Levels of Care for the Hospital – 2014

Level I:

Neurologic Intensive Care Unit (ICU) – Life saving; focus on breathing, heart rate, reducing risk and complications of second injury phenomenon

Step-down – Medical stability for all systems

Level II:

Inpatient Rehabilitation – Medical stability is maintained; focus is on mobility, strength, safety, and basic communication of needs; family training and education are emphasized for return home... if possible.

Continuum of Care – 2014

Level III:

Post-hospital Community Neurorehabilitation Care since 1970; neurorehabilitation programs following the hospital course within an applied setting for skills use and generalization

Neurobehavioral Intense – Significant behavioral intensity programs; focus is on behavioral stability targeting irritability, impaired awareness, social contact, problem solving, goal directed initiation

Supported Living Rehabilitation – Designed for those who require a longer level of care that is more gradual; focus is on quality and instrumental activities of daily living

Day Treatment – Extension from residential neurorehabilitation; live at home or in the community and focus on skills use

Home and Community – Model is designed to apply therapy in the home and to work with persons in the community

Continuum of Care Model - 2014

Research concludes...

Each level of care produces positive results.

Level of disability changes by at least one level. When neurorehabilitation at the residential level is followed by day treatment, then greater gains are made.

Rehabilitation is not a quick process.

There are very specific differences by program type which needs to be recognized and considered standards of care.



Measuring Outcomes in Post-hospital Brain Injury Programs



The Mayo Portland Adaptability Inventory (MPAI)

Version 4 (2008)

Purpose of the MPAI-4

- Clinically evaluate persons during post-acute care following acquired brain injury (ABI)
- Evaluate rehabilitation programs – measure, modify, performance improvement
- Provides a standardized measure of outcomes for accrediting bodies such as Commission on Accreditation of Rehabilitation Facilities.
- **Better understanding of the long-term needs of those with ABI**
 - We can study aging in place.
 - We can study how deficits change through time.
 - We can measure function based on remediation vs. compensation of skills.

Impact of the Mayo-Portland

- 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 for payment.
- Use of this measure provides a national standard that is endorsed by the Brain Injury Association of America that endorses standards of care.
- **Advocacy** – This allows all providers a standard method of showing how different levels of care work to reduce disability impact – this saves on cost and helps the individual to achieve their goals

The scale – What does it actually measure?

- 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 six 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)

Level of Disability

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

Abilities – Physical, Communication, Cognitive

- *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
- *Audition (04)*: problems hearing, ringing in the ears
- *Dizziness (05)*: feeling unsteady, lightheaded, or dizzy
- *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
- *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 – Neurobehavioral

- *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.
- *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
- *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 – Instrumental Activities of Daily Living

- *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
- *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

Participation – Instrumental Activities of Daily Living

- *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
- *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

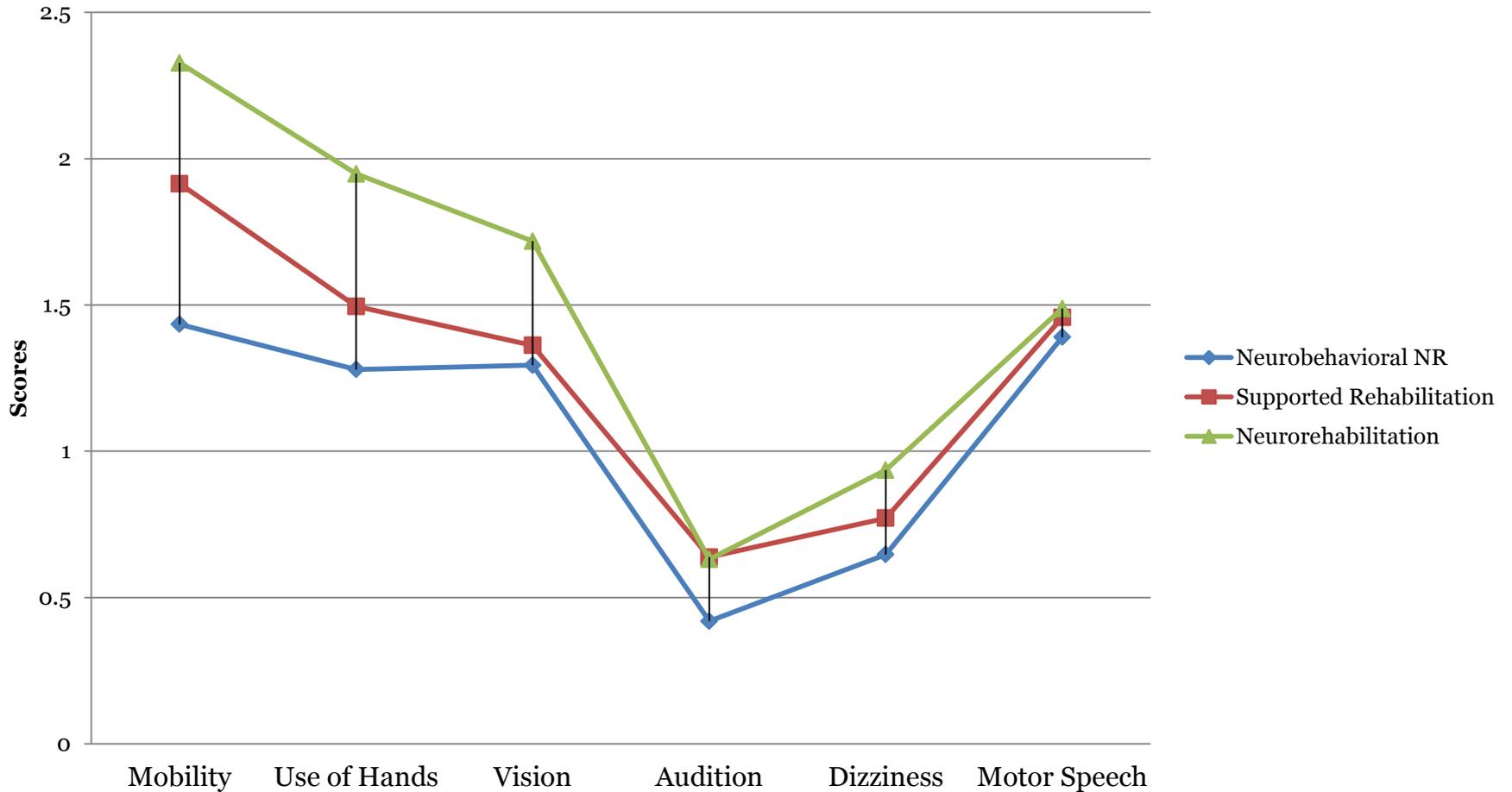


National Database Analysis

NeuroRestorative, 2015

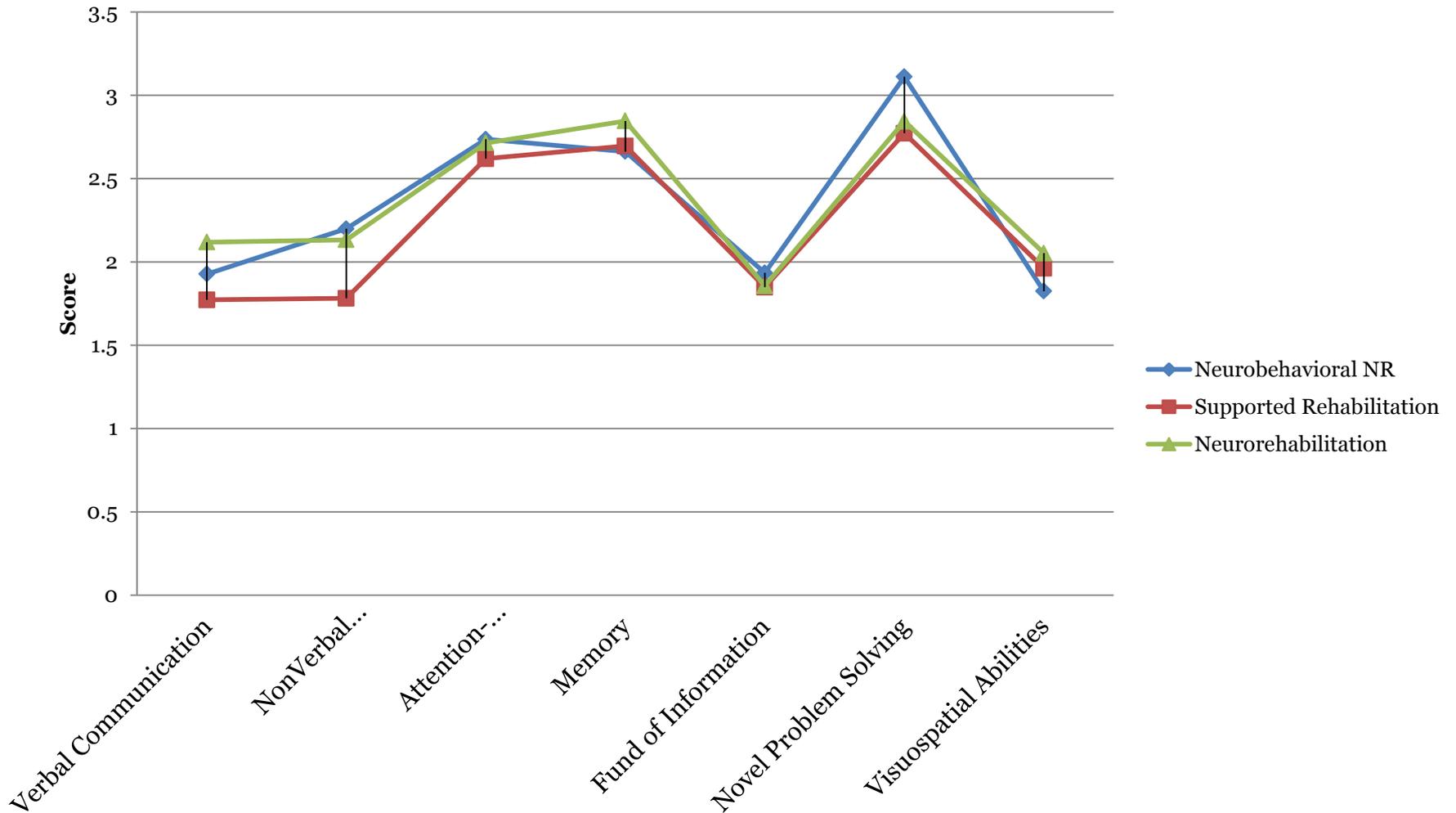
Continuum of Care Model - 2014

Comparisons of Groups – Physical Needs



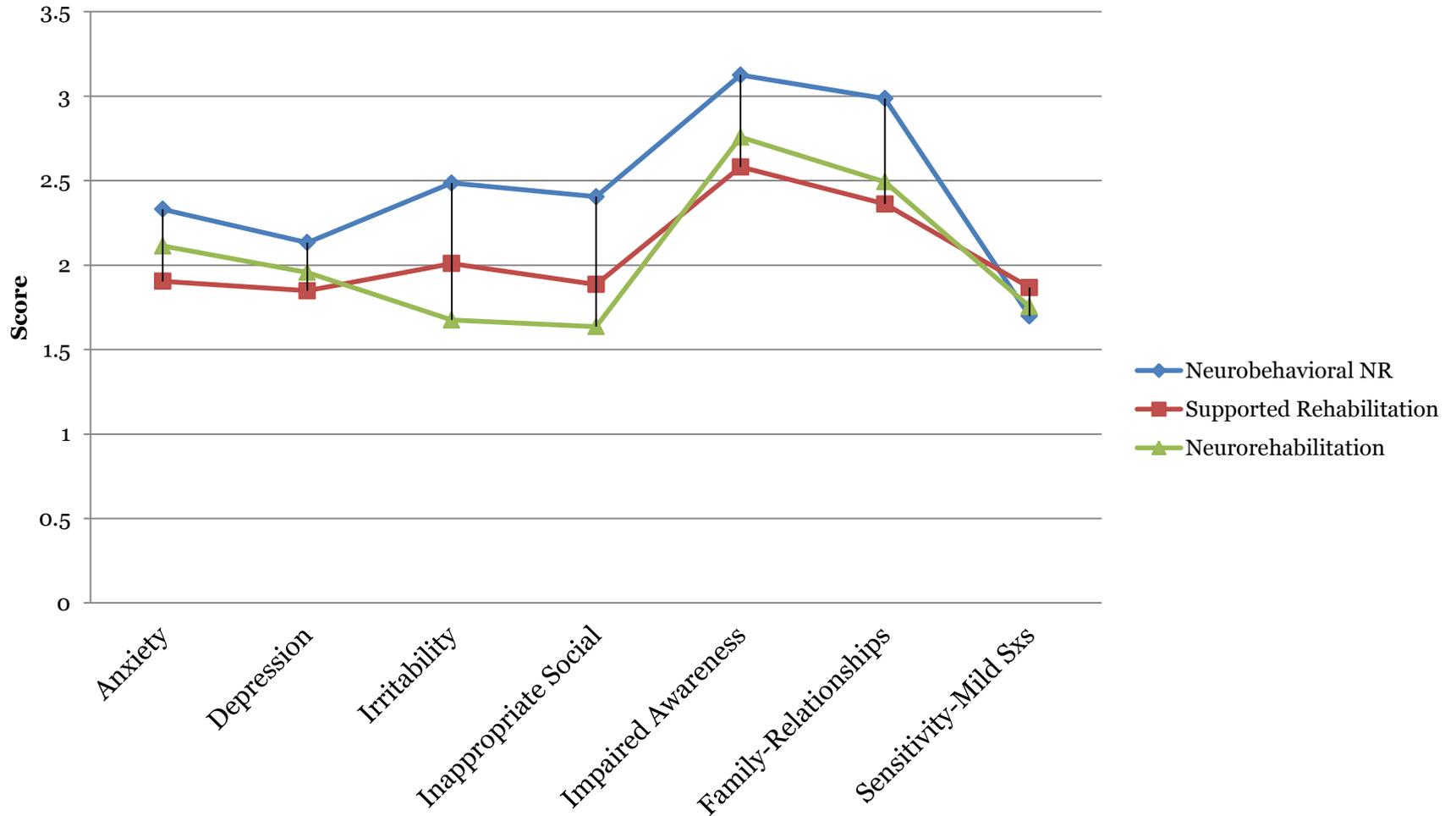
Continuum of Care Model - 2014

Comparison of Groups - Cognitive Needs



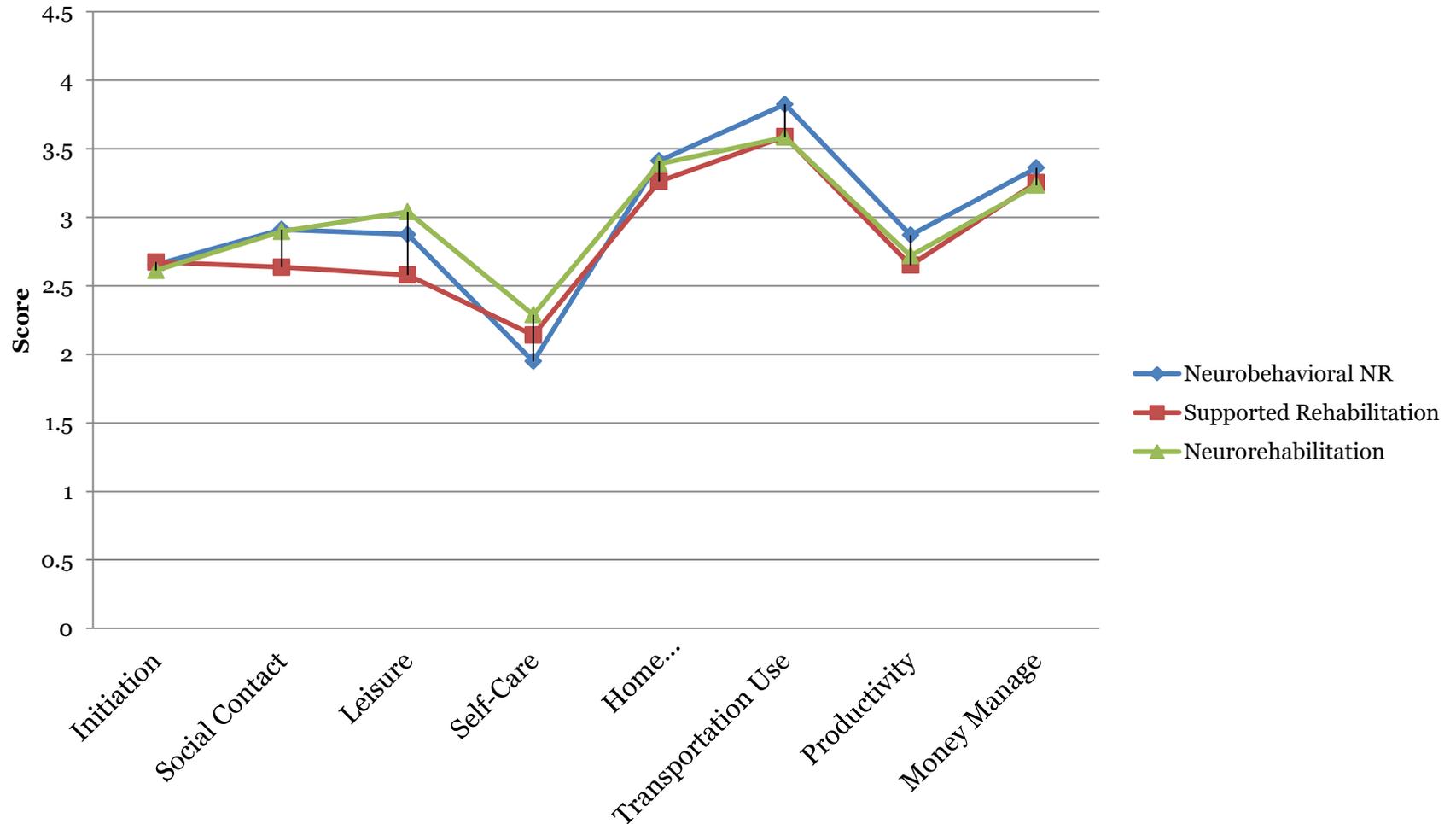
Continuum of Care Model - 2014

Comparison Groups - Adjustment Needs

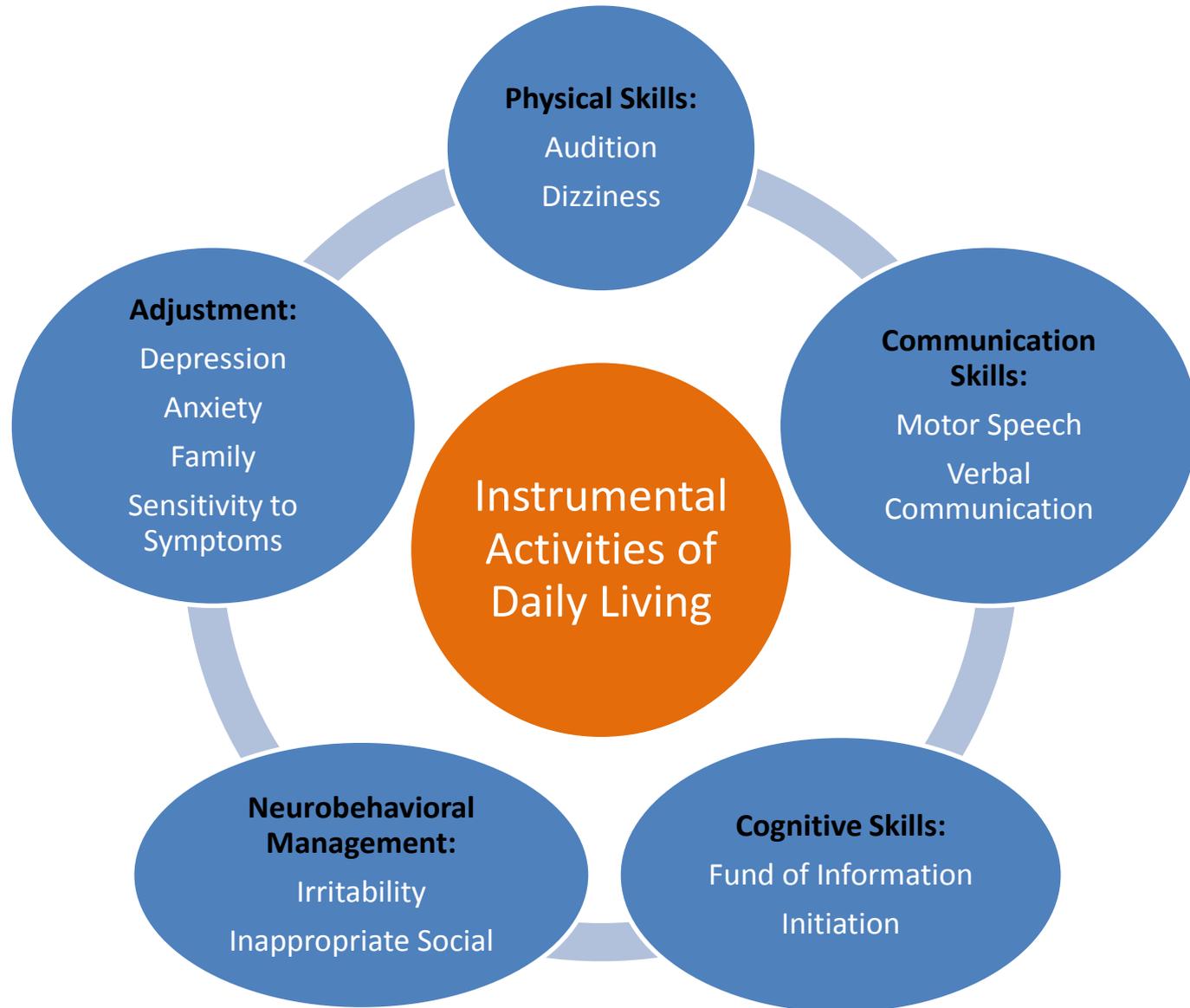


Continuum of Care Model - 2014

Comparison Groups – Instrumental Activities of Daily Living



Research in Progress (2015) – Changed Perspective



Current Research

A recent discovery with RASCH analysis revealed that in post-hospital residential care, there is an order of recovery to neurological rehabilitation approaches that differs from the acute level of care (N = 1,500 survivors).

Level 1: Audition, dizziness, motor speech, pain

Level 2: Inappropriate social interaction, and irritability

Level 3: Vision, symptom sensitivity, current events knowledge

Level 4: Adjustment – depression, anxiety, communication, visual-spatial skills

Level 5: Family adjustment; mobility skills

Level 6: Fatigue, non-verbal communication skills, self-care

Level 7: Initiation

Level 8: Attention, awareness, novel problem solving, memory

Level 9: Leisure, money management, transportation, home care, productivity



Long-term outcomes using the national
database for comparisons...

Does Rehabilitation Work?

Improvement & Chronicity

In 2013, the brain injury associations have agreed that traumatic brain injury is a “chronic medical condition.”

Therefore, the focus and emphasis needs to be over the lifetime and not based on a “one event – one time treatment” approach.

(Masel & DeWitt, 2010)

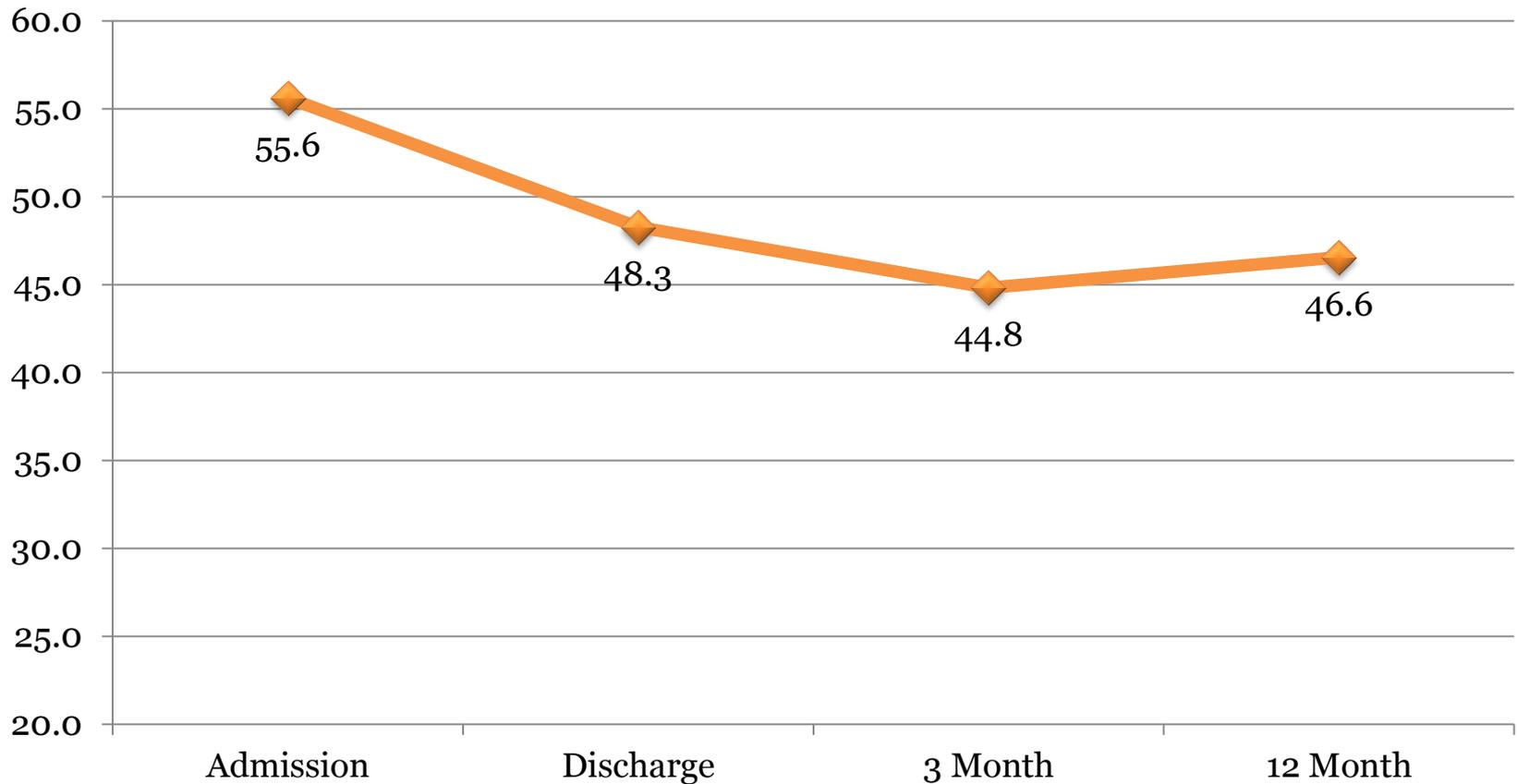
Long-term disability can be improved with services, supports, and a plan to reduce the impact of that disability at home, in the community, and with supervision needs.

Post-hospital treatment was able to show improvement beyond the traditional first year of recovery.

(Lewis & Horn, 2013)

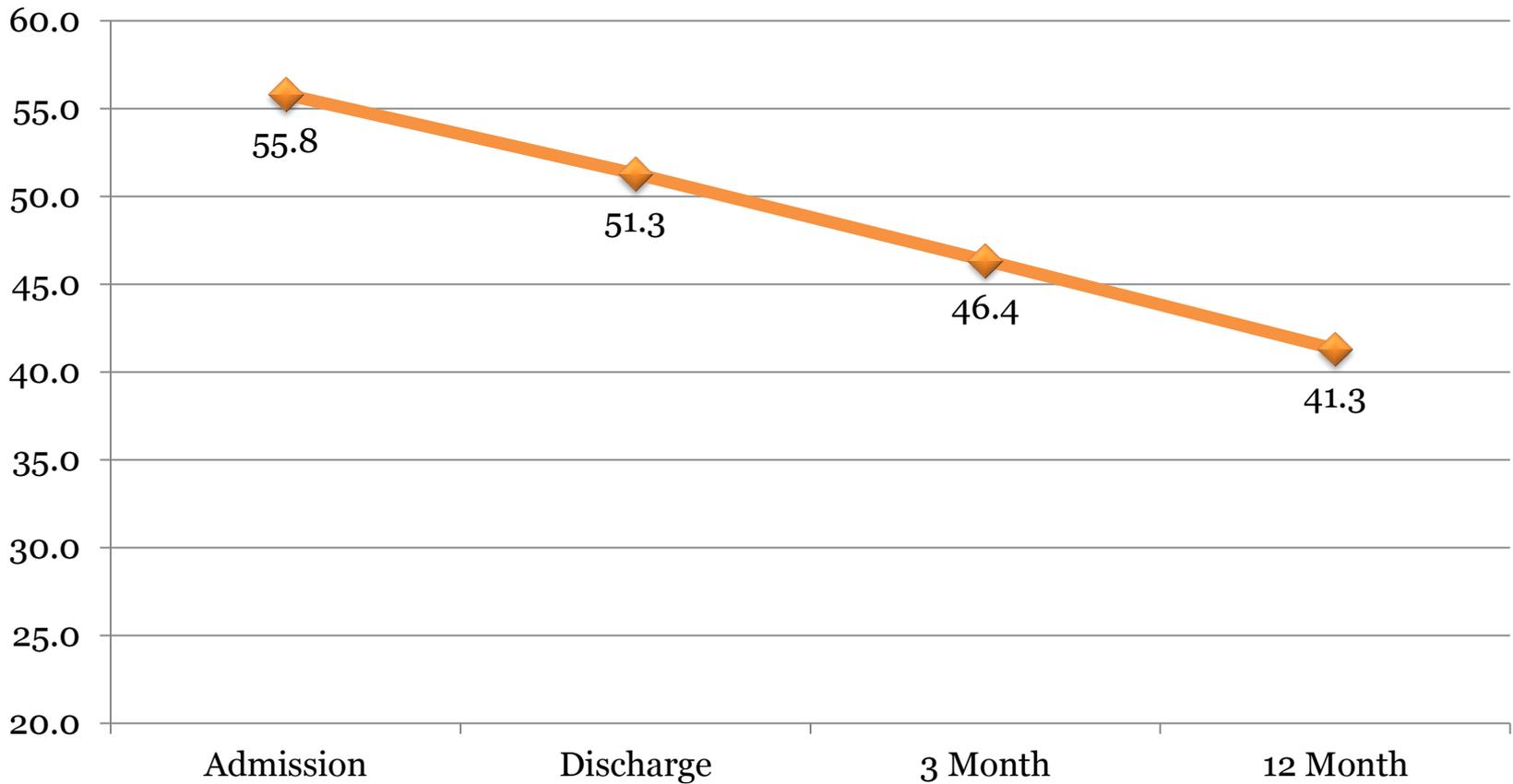
Outcomes Analysis – 949 neurorehabilitation adult survivors

Participation Scores



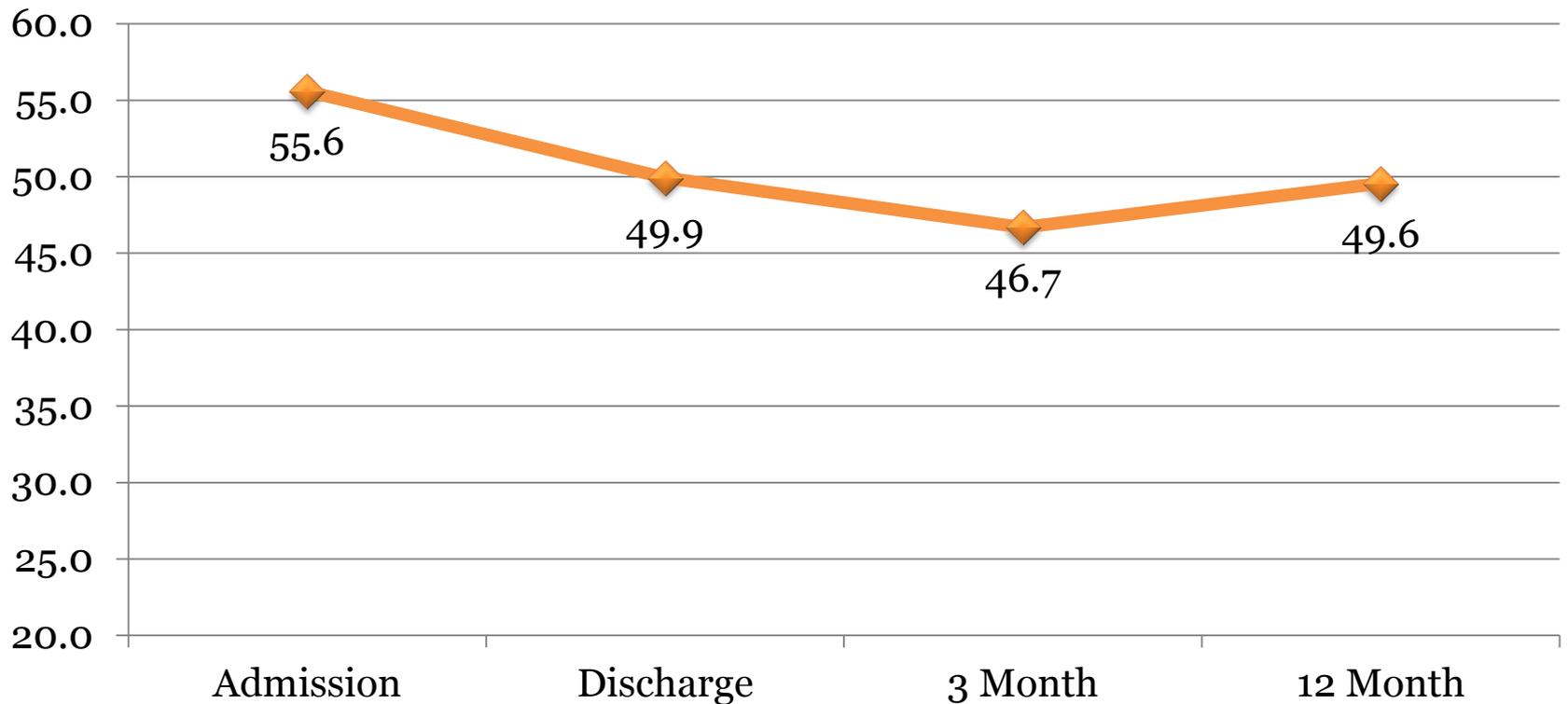
Outcomes Analysis – 150 neurobehavioral adult survivors

Participation Scores



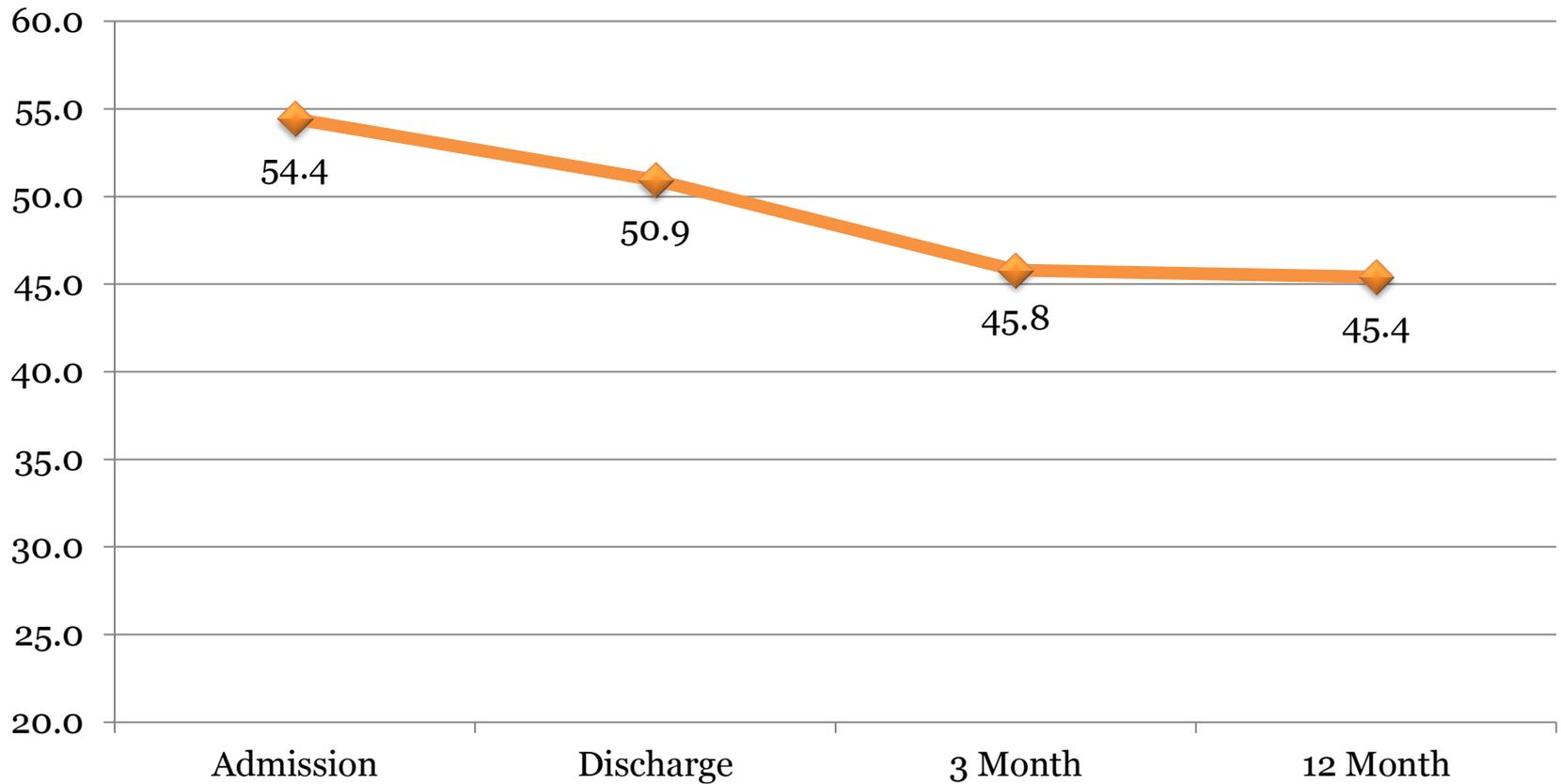
Outcomes Analysis – 106 child survivors neurorehabilitation and neurobehavioral

Participation Scores



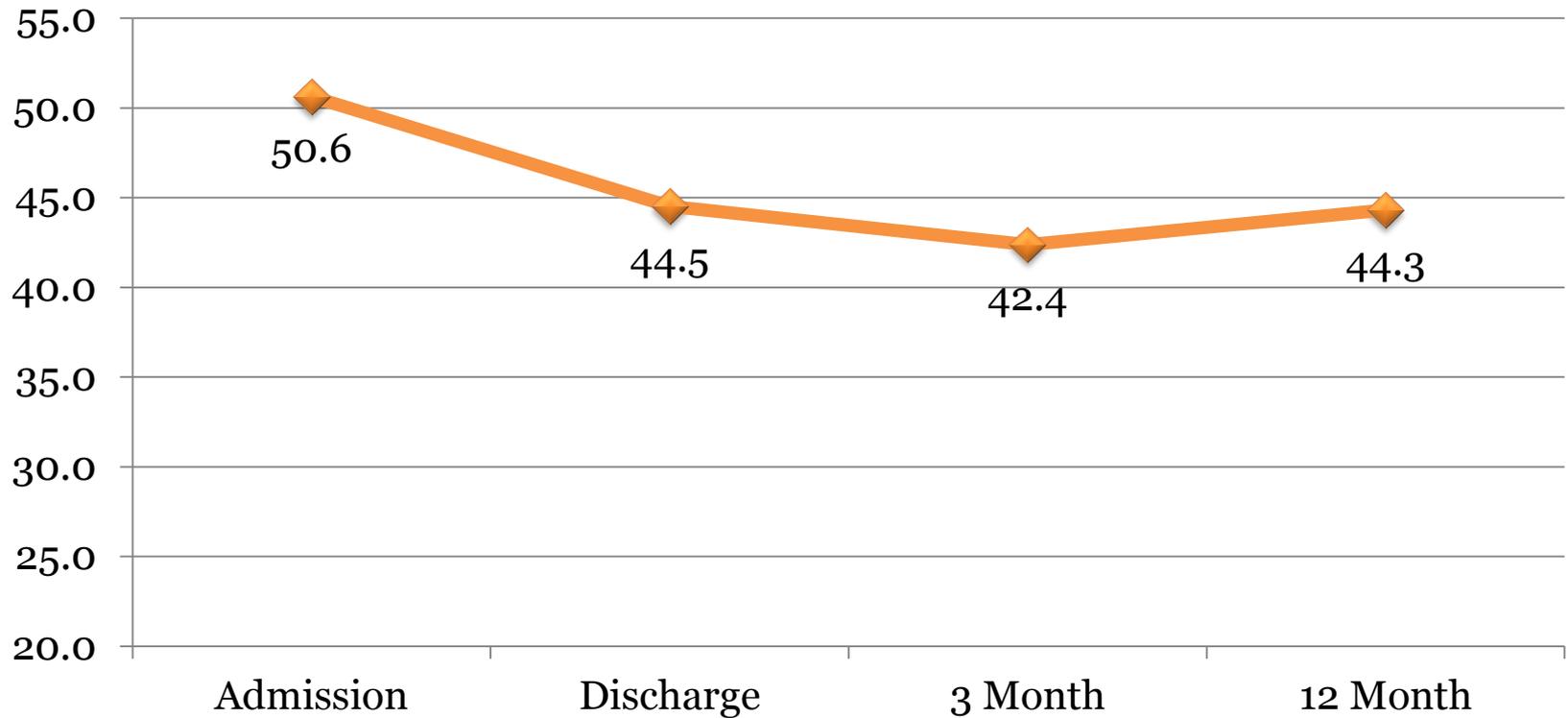
Outcomes Analysis – 112 supported rehabilitation

Participation Scores



Day Treatment – 181 adult survivors

Participation Scores



Current Conclusions

- 1) Research does not support that time heals all.
- 2) Age is not a factor in recovery – all ages show progression with intervention at a functional level.
- 3) Anxiety and depression have an effect on recovery.
- 4) Treatment needs to be considered in relation to goals and community integration - functional
- 5) Even those with longer-term injury greater than 20 years can show stability and modest improvements.
- 6) Cognitive and physical exercise have shown to improve healthy aging and has shown to reduce the chances of atrophy of the brain as demonstrated by MRI.



Applications to Home

Home Ideas... Translating to the Environment

Therapy needs to eventually apply to home skills use and being functional in the community.

Therapy can be performed in a variety of ways in and out of the home for carryover and behavior skills.

Educate family for carryover of skills with professionals.

Intermittent professional services.

Home Ideas...further translation with limited resources

Cognitive Skills:

Includes preferred activities, use of computer programs such as Lumosity (<http://www.lumosity.com>), reading, using a computer or tablet, playing games with family and friends, spending time with emails, researching topics, and reading current events or the daily newspaper

Physical Skills:

Walking, riding a bike, or moving in a productive way that leads to increased heart rate. Practicing skills such as lifting, bending, going around barriers, painting, doing arts and crafts, photography or any activity of interest that requires movement

Leisure Skills:

Art, hobbies, pursuing life long interests, reading, watching movies, meditating, taking a class, volunteering, going to concerts, driving (if possible)

Community:

Volunteering, going in to the community each, taking part in a community activity, church or synagogue participation, join a group, etc.

POLLING QUESTION #4

How will you apply the evidence based-research from today's presentation?

- I will consider using this information to improve the services I/my facility delivers.
- I will consider a research question related to these findings.
- I will consider including this information in information provided to patients and families.
- Not applicable



Advocacy for those who need a voice...

Proposed ideas...

1. **Clinical programs work.** We need to get the word out to legislators and funding sources.
2. **Chronic disease** requires long-term supports and care to reduce cost and impact on the entire healthcare system.
3. Supports need to include a **system approach** that involves survivors, family resources, home and community needs, expert providers, and adequate funding.
4. We need to focus on a **flexible continuum of care** for brain injury rehabilitation.
5. We need to use **evidenced-based models of care** that have shown positive outcomes by reducing disability.
6. **Prevention** needs to continue.

Proposed ideas...

We need to research and educate!

It is not about what we think, it is about what we can show with science and technology.

It is about showing that disability does not mean lack of value.

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If we do this together... anything is possible.

Thank you for your time today.

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