

High-Quality, Equitable, Evidence-Based Brain Injury Rehabilitation



MODERATOR: JOHN CORRIGAN, PH.D.

FEATURED SPEAKER: MRS. NIKKI DAVIS

**PRESENTERS: RISA NAKASE-RICHARDSON, PH.D., JEANNE
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Disclaimer:

- The views expressed in this presentation are those of the authors and do not necessarily represent the official policy or position of the Departments of Veterans Affairs or any other U.S. government agency.

Outline

7:30-8:00

- Lived Experience Story
- Access to Evidence-Based Care: Research Translation and the Story of I-HEAL

8:00-8:45

- IHEAL Project 3: Empowering Teams to Implement Evidence-Based Behavioral Interventions (TEAM-BI)

8:45-9:30

- Evidence-Based Rehabilitation for Disorders of Consciousness

9:30-9:45

- Break

Outline

9:45-10:30

- Evidence-Based Cognitive Rehabilitation

10:30-11:15

- I-HEAL Project 2: Adapting Behavioral Health Therapies for People with Cognitive Disabilities

11:15-12:00

- Moderator and Guest Speaker Comments
- Panel Discussion
- Questions and Answers

The Art of Redirection

Mrs. Nikki Davis
Lived Experience
Partner





Our Story



Inpatient Reality



The Art of Redirection



Transition to Home

Connecting to Providers



Families as Part of Care



Colonoscopy Day



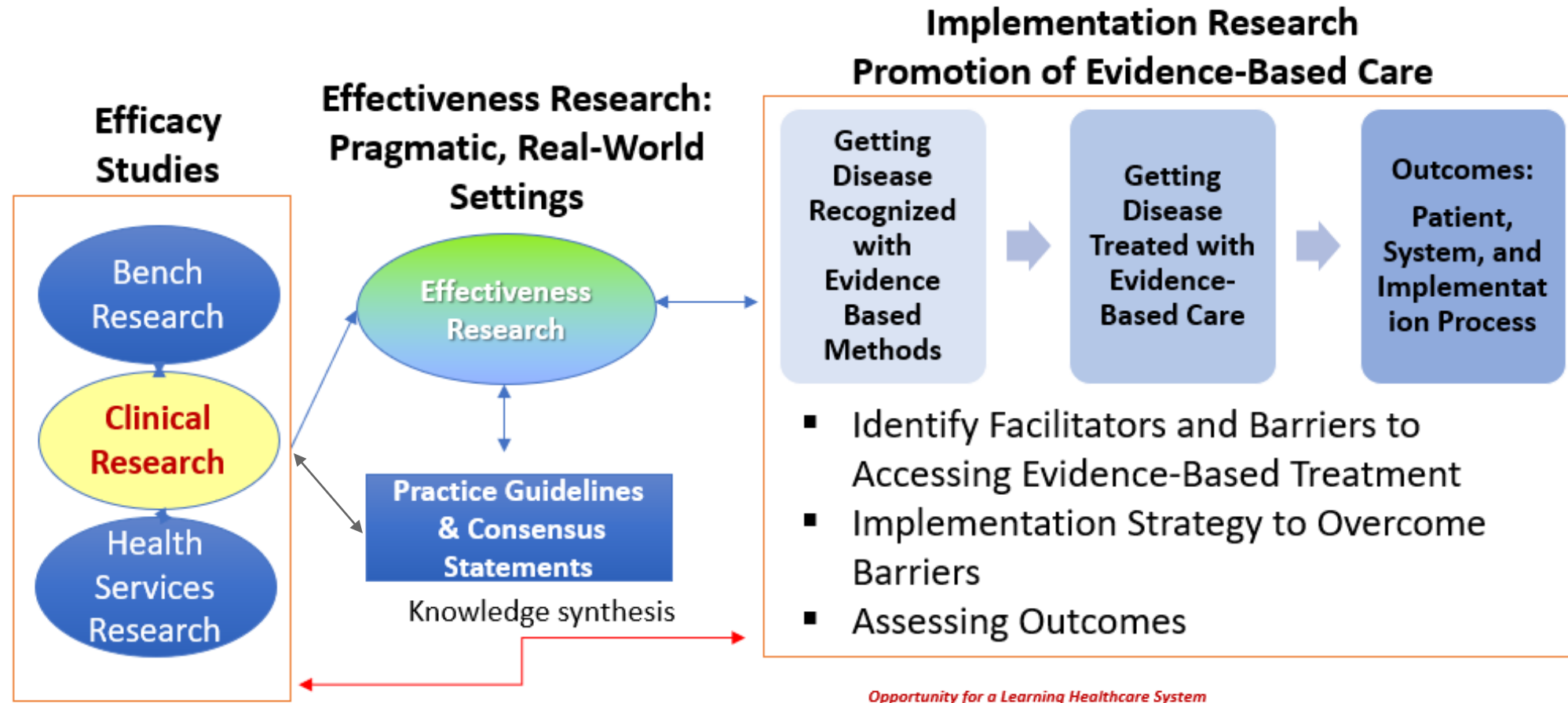
Ernie Today





Thank you!

STAGES OF RESEARCH TRANSLATION



- 14% of research from RCT takes an average of 17 years to reach the patient's bedside¹
- Publications alone **do not** get providers to adopt evidence-based interventions
- Guidelines alone **do not** get providers to adopt evidence-based interventions
- Partnerships between scientists across clinical sciences, health services & implementation research are needed to promote adoption of new knowledge into practice

1. Committee on Quality of Health Care in America, Institute of Medicine. Crossing the Quality Chasm: A New Health System for the 21st Century. Washington, DC: National Academies Press; 2001.

Research to Practice Pipeline

An Update from Cancer Guidelines

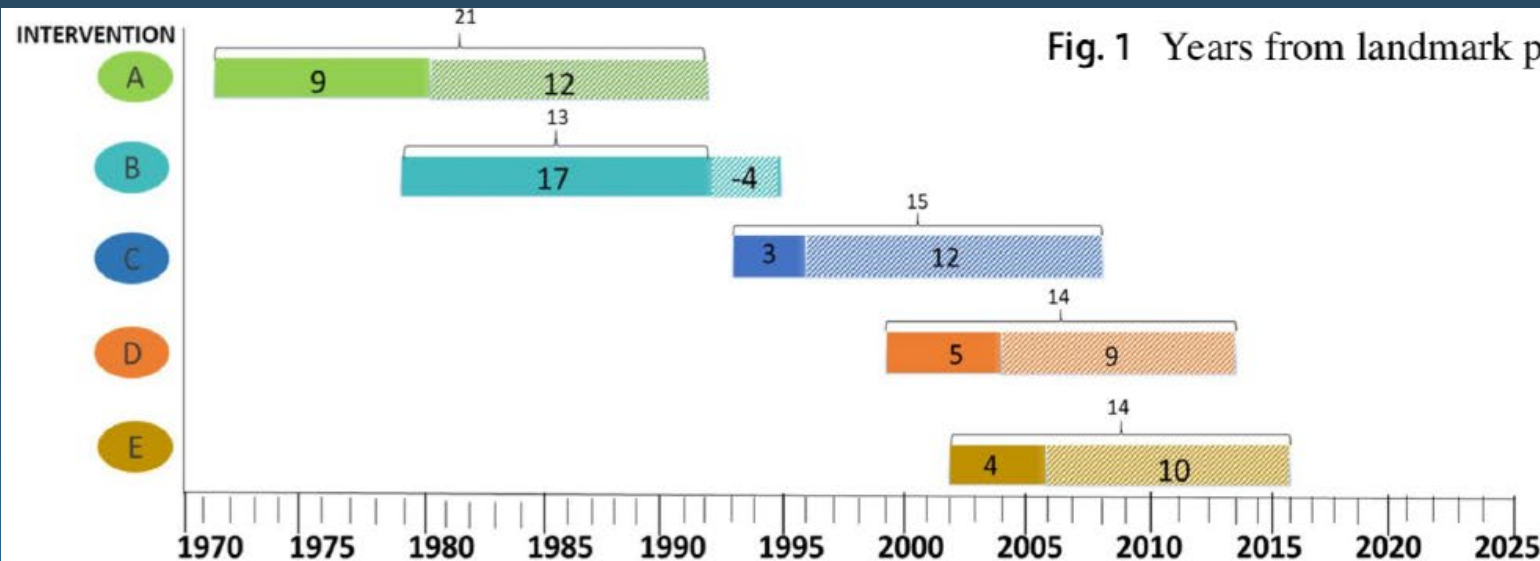
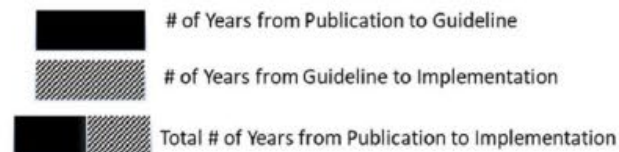


Fig. 1 Years from landmark publication to guideline to implementation

Khan S, Chambers D, Neta G. Revisiting time to translation: implementation of evidence-based practices (EBPs) in cancer control. *Cancer Causes Control*. 2021 Mar;32(3):221-230.

- A Mammography for women ages 50-74 within the past two years ^[16]
- B Clinicians' Advice to quit smoking for adult smokers seeing a physician during the past 12 months ^[19]
- C Colorectal Cancer Screening for adults ages 50-75 based on most current screening guidelines ^[32]
- D Co-testing for cervical cancer screening using combination of pap and HPV test for women ages 30-65 ^[6,7]
- E HPV vaccination ≥2 doses for male and female adolescents ages 13-17 ^[50]

Legend





Engagement can...

Occur before, during, and after the study

Research design

Research conduct

Dissemination

Can include interested parties such as:

Patients

Clinicians

Administrators

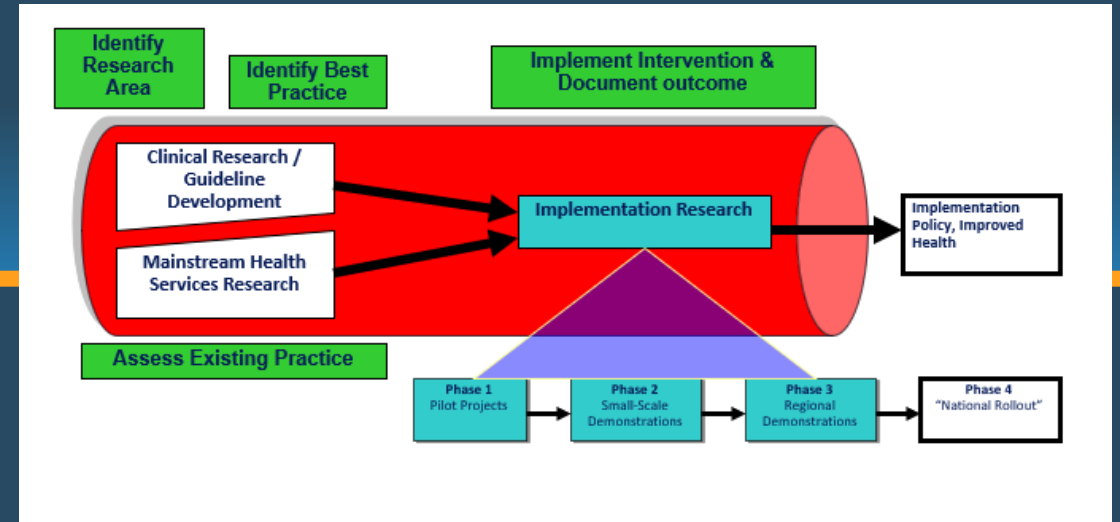
Researchers

Professional organizations

What is dissemination and implementation (D&I) science?

- **Problem:** There is a well-documented gap between research (e.g., evidence-based programs, interventions, guidelines) and practice (e.g., what is routinely delivered in real-world clinical settings).
- Dissemination and Implementation Research is “the scientific study of methods and strategies that facilitate the uptake of evidence-based practice and research into regular use by practitioners and policymakers.”

Sample D&I Questions



How can we increase **access** to this evidence-based intervention?

How do we ensure that access to this evidence-based intervention is **equitable**?

How can we best **deliver** this evidence-based intervention in specific contexts?

What are the **barriers** to this evidence-based intervention and how can we address them?

Why did this evidence-based intervention “**work**” at Location X but not at Location Y?

Can I **adapt** this evidence-based intervention to be delivered differently and have it



Improving Health Care Access and Engagement for Veterans and Service Members with TBI Morbidity (I-HEAL)

Risa Nakase-Richardson, PhD

Rehabilitation Neuropsychologist, I-HEAL PI, James A. Haley Veterans' Hospital, Tampa, FL



Risa Nakase-Richardson, Ph.D., Contact PI
Funding Source(s): DOD CDMRP (\$6,325,327)
Period of Performance: September 2023-September 2027

Study Organization

Executive Leadership



Engagement
MPI: Megan Moore



Administration
PI: Risa Nakase-Richardson



Implementation
MPI: Jolie Haun

Supportive Cores

**Community
Engagement
Council**

Operations

**Data &
Communication**

**Implementation
Science**

I-HEAL Projects

Project 1: Cognitive
Nudge Decision Support
Tool

PIs: Dams-O'Connor,
Silva, Coulter

Project 2: Adapting
Behavioral Health
Interventions

PIs: Hoffman, Martin,
Goldschmidt

Project 3: Team-Based
Behavioral Intervention

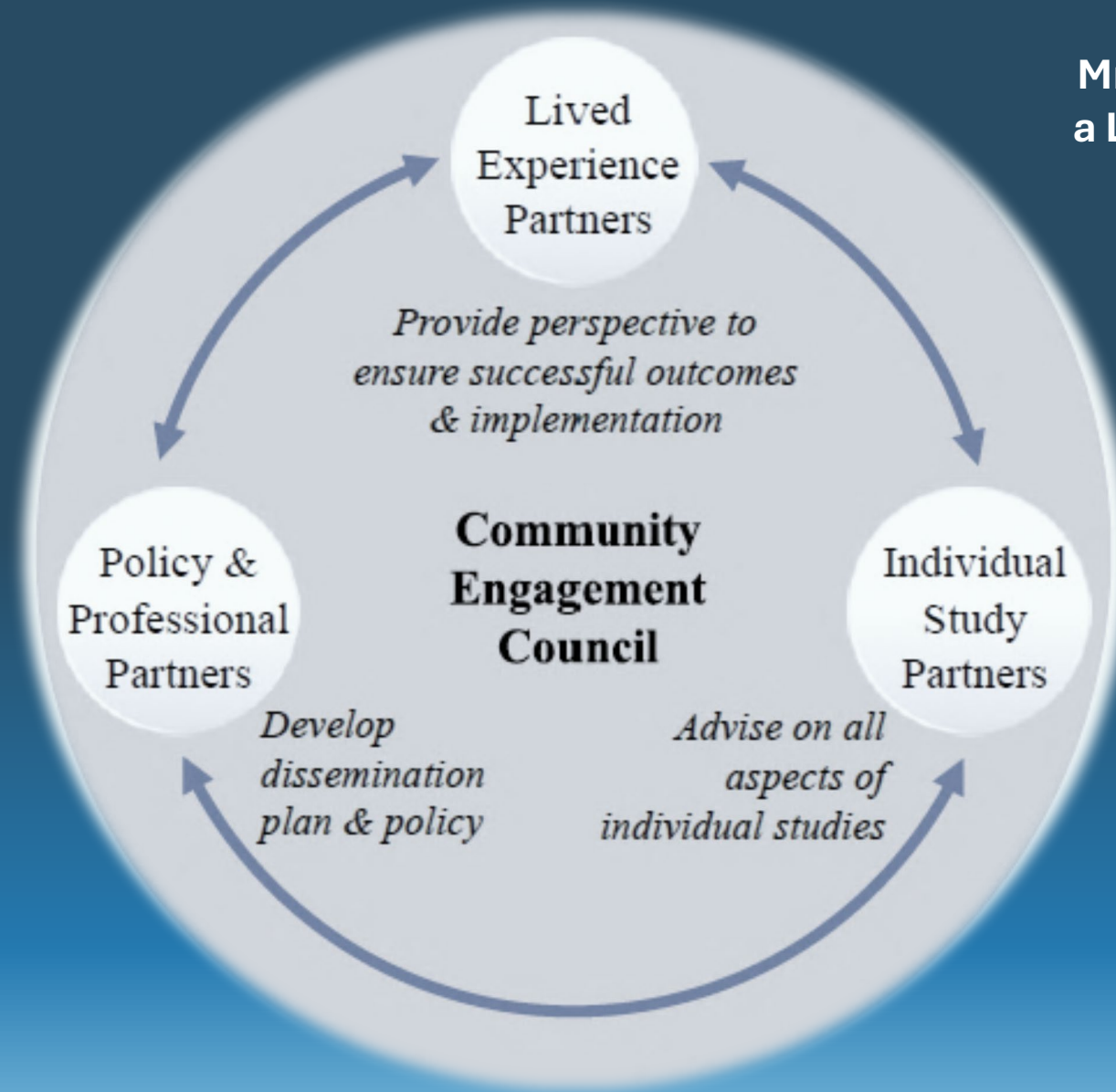
PIs: Bogner, Kretzmer

Project 4: Data Driven
Policy Recommendations

PI: Haun



**NAN is a
Professional
Partner**



**Mrs. Nikki Davis is
a Lived Experience
Partner**



Improving Access to Care for Persons with TBI

Year 1 Cumulative I-HEAL Engagement Encounters

Cumulative Stakeholder Engagement Across Meetings: 306

Total Number of Engagement Meetings: 43



Identify facilitators and barriers to evidence-based chronic pain treatments for persons with TBI

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Office of the Chief of Staff, James A. Haley Veterans Hospital, Tampa, FL

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Provider Perceived Facilitators and Barriers to Identifying, Perceiving, and Seeking Healthcare for Chronic Pain After TBI: A Qualitative NIDILRR and VA TBI Model Systems Collaborative Project

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Provider Perspectives of Facilitators and Barriers to Reaching and Utilizing Chronic Pain Healthcare for Persons With Traumatic Brain Injury: A Qualitative NIDILRR and VA TBI Model Systems Collaborative Project

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Stakeholder Engagement to Identify Implementation Strategies to Overcome Barriers to Delivering Chronic Pain Treatments: A NIDILRR and VA TBI Model Systems Collaborative Project

Healthcare Equity for Cognitive Disability

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Provider Perspectives of Facilitators and Barriers to Reaching and Utilizing Chronic Pain Healthcare for Persons With Traumatic Brain Injury: A Qualitative NIDILRR and VA TBI Model Systems Collaborative Project

Barriers and Facilitators to accessing comprehensive pain programs **were identified** through provider interviews

- **63 providers** were recruited through email/listserv introduction of the study to **learn about barriers to pain treatment** based on the Levesque Access to Care conceptual framework

Overall Top Barrier Determinants (Themes) to Accessing Care

Theme: Cognitive deficits of patients; 67% Saturation

“Some of the challenges, particularly with TBI patients, are the cognitive considerations [to help] them remember to utilize strategies [if they] have the ability to learn and utilize new strategies for pain management...For some, difficulty learning [new] information or communication issues can be more challenging.”

Overall Top Barrier Determinants (Themes) to Accessing Care

Theme: Patient participation (no show, don't follow up, non-compliant); 62% Saturation

“TBI patients unfortunately forget things; they're not as compliant because they don't remember. You [must] be cognizant of that when treating TBI patients. It's the patient population. You give them five or ten things to do, they [are] probably not going to do any of them.”

Patient Ability to Access Treatment

(providers perceived top barriers here)

Barrier	Behavioral Health	Comprehensive Program	Substance Use Disorder Tx
Patient Belief in Tx	94%	88%	90%
TBI Morbidity	92% ^c	92% ^c	92% ^c
Pt Culture Norms	64%	55%	67%
Lack of Caregiver Support	69% ^c	65% ^c	69%
Distance to Tx	85% ^c	91%	85%
Patient Cannot Afford Tx	60% ^c	66% ^c	62% ^c

Number Represents % Indicating Sometimes or Almost/Always on Likert Scale

Nakase-Richardson R, Haun J, Sevigny M, Martin A, Hanks R, Hammond F, Kane G, Ryan J, Gilmore N, Campbell-Montalvo R, Hoffman J. TBI disability, health beliefs, and workforce capacity are top barriers to chronic pain guideline-based interventions. *Archives of Physical Medicine and Rehabilitation*, Available online 13 June 2025.

I-HEAL Website:





Improving Access to Care for Persons with TBI

Empowering Teams to Implement Evidence-Based Behavioral Interventions (TEAM-BI)

Presenting Author:

Jennifer Bogner, PhD, ABPP, FACRM

Professor

Bert C. Wiley MD, Endowed Chair Physical Medicine and
Rehabilitation

Department of Physical Medicine and Rehabilitation
The Ohio State University



TBI-Related behavior changes should not interfere with access to effective rehabilitation, but they do

- Challenging behaviors after moderate-severe TBI are *common* and often *impact* access and quality of care.
- Possibly due to the *lack of* perceived alternatives, one-third of providers worldwide reported treating challenging behaviors with sedating medications thought to impede adaptive behavior, cognition and recovery (Carrier et al, 2021).
- Effective methods for optimizing adaptive behavior exist, but *widespread* implementation has *not yet* occurred.

SOLUTION



Develop and pilot a Playbook for implementing “*Team BI: Team Based Behavioral Interventions*” in the inpatient setting



Building on an existing program, we will develop a Playbook specifically addressing the needs of people with TBI

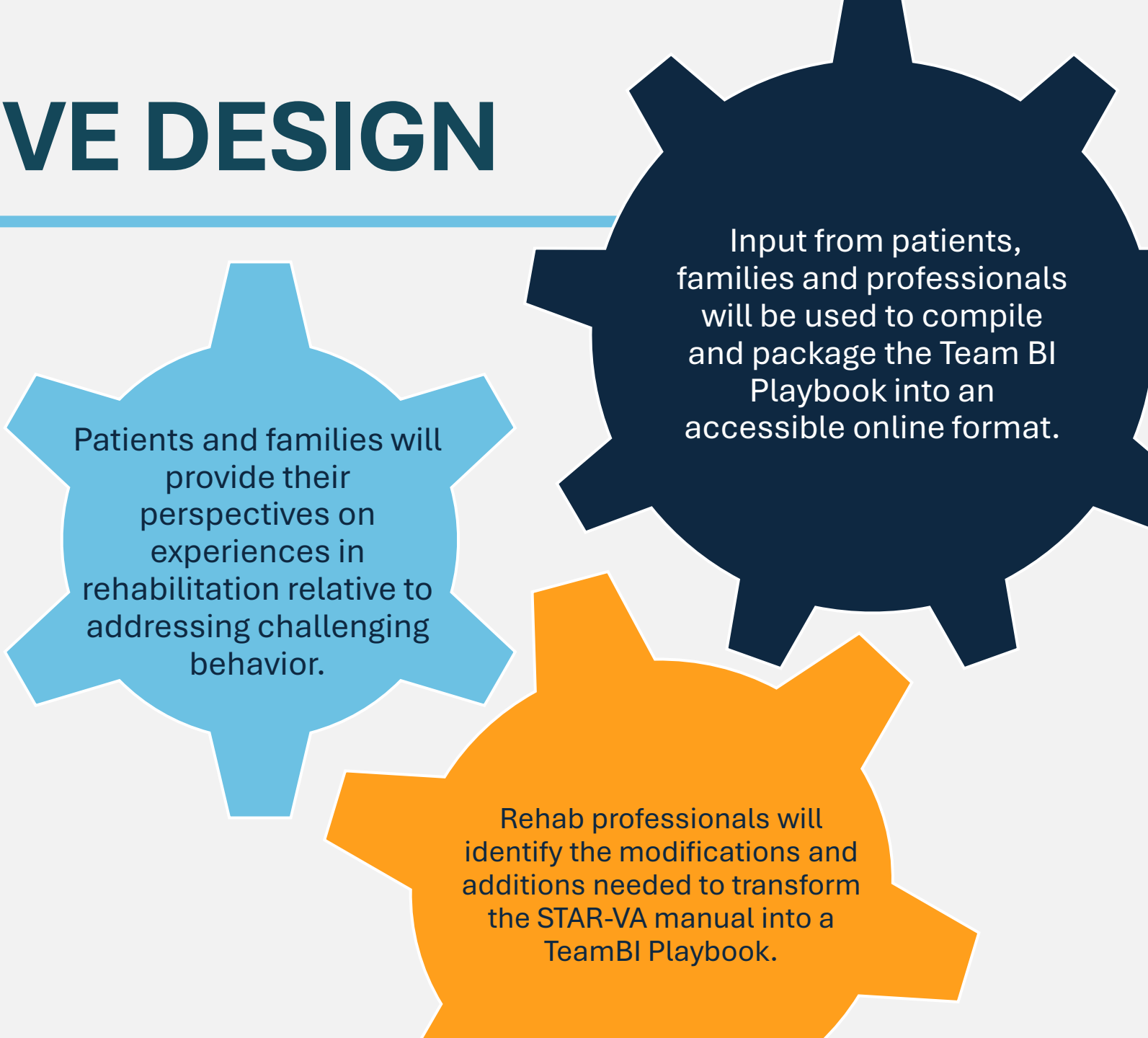
- The existing program (STAR-VA) was developed for teams working with people with dementia—it will be modified substantially for use with persons with TBI



Based on collaboration between rehabilitation professionals and persons with lived experience (family members and persons with TBI).

COLLABORATIVE DESIGN

Co-design a Team-based Behavioral Interventions Playbook with rehabilitation team members, persons with brain injury and family members/care partners



Patients and families will provide their perspectives on experiences in rehabilitation relative to addressing challenging behavior.

Input from patients, families and professionals will be used to compile and package the Team BI Playbook into an accessible online format.

Rehab professionals will identify the modifications and additions needed to transform the STAR-VA manual into a TeamBI Playbook.

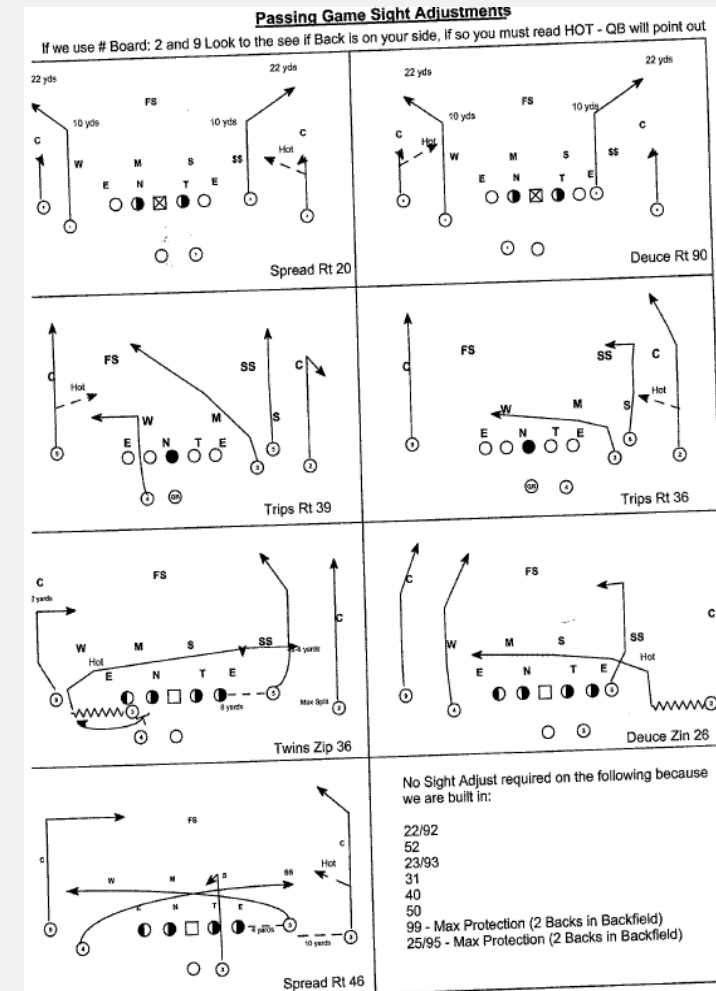
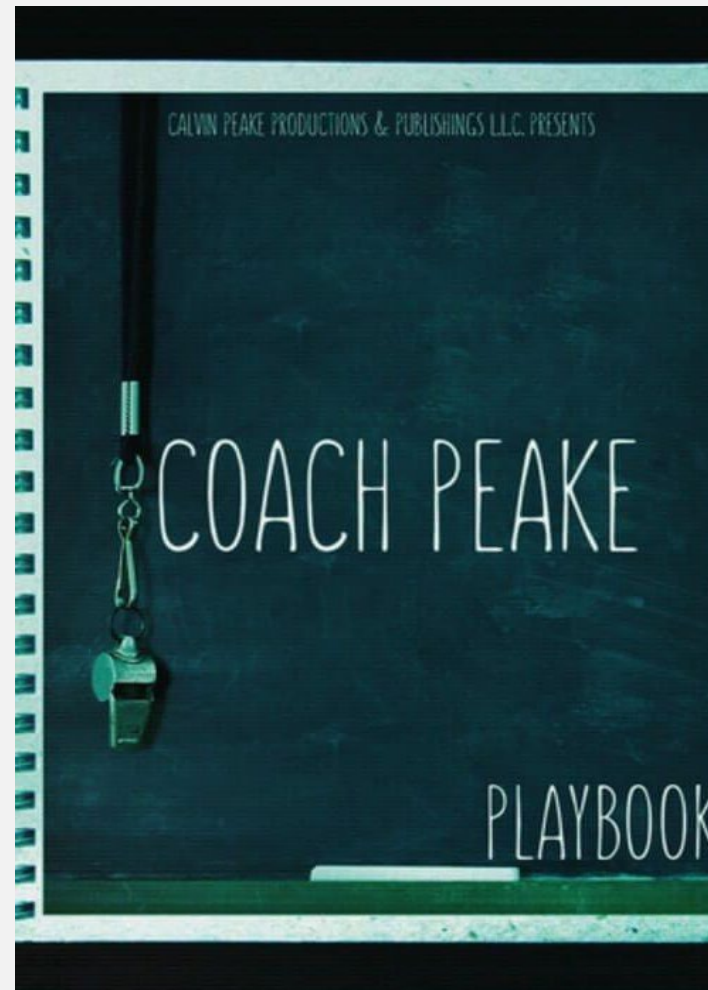
YOUR EXPERTISE NEEDED

- Some of you may have created or experienced similar programs at your site and it continues to flourish
- Some have created or experienced a similar program, but could not sustain it
- Some have tried to launch a similar program, but encountered obstacles
- Some may want to create a “Team-BI” program, but anticipate obstacles

FOR DISCUSSION AT END OF THIS PRESENTATION

- Who might be the leads/champions at your site?
- Will Staff Partners be on board? If not, how can buy-in be facilitated?
- What kinds of support will you need from leadership?
- What would persuade leadership to provide this support?
- If you are able to launch Team-BI, will it be difficult to sustain? What strategy(ies) might overcome barrier(s) for sustaining Team-BI?

TEAM-BI PLAYBOOK



PURPOSE OF TEAM-BI PLAYBOOK



Provide a “how-to” for setting up environment that optimizes adaptive behaviors and minimizes challenging behaviors



A family section will emphasize the collaboration between staff and family to prepare for promoting adaptive behaviors when the person returns home



Will provide strategies for implementing and sustaining the program in inpatient rehab settings

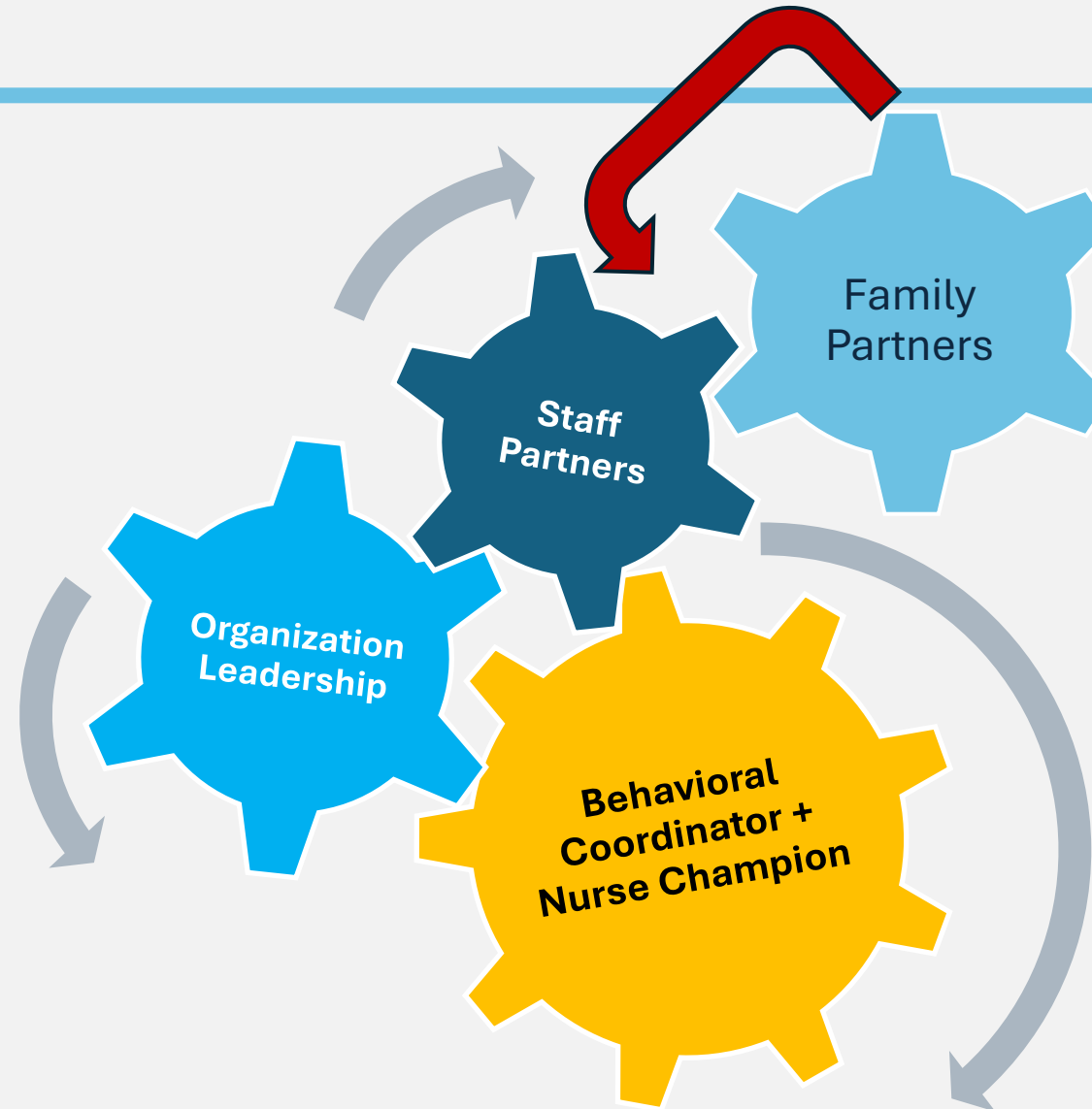
STAR-VA ORGANIZATIONAL STRUCTURE



TEAM-BI ORGANIZATIONAL STRUCTURE



TEAM-BI ORGANIZATIONAL STRUCTURE



SECTIONS

Introduction to Behavior Changes after TBI

Supported Communication

Post-traumatic Confusion and Agitation

ABCs-Antecedents, Behavior, Consequences

Partnering with Families

Creating Team-BI at Your Site

SECTION STRUCTURE

Objectives and outline

Narrative Background

Case examples

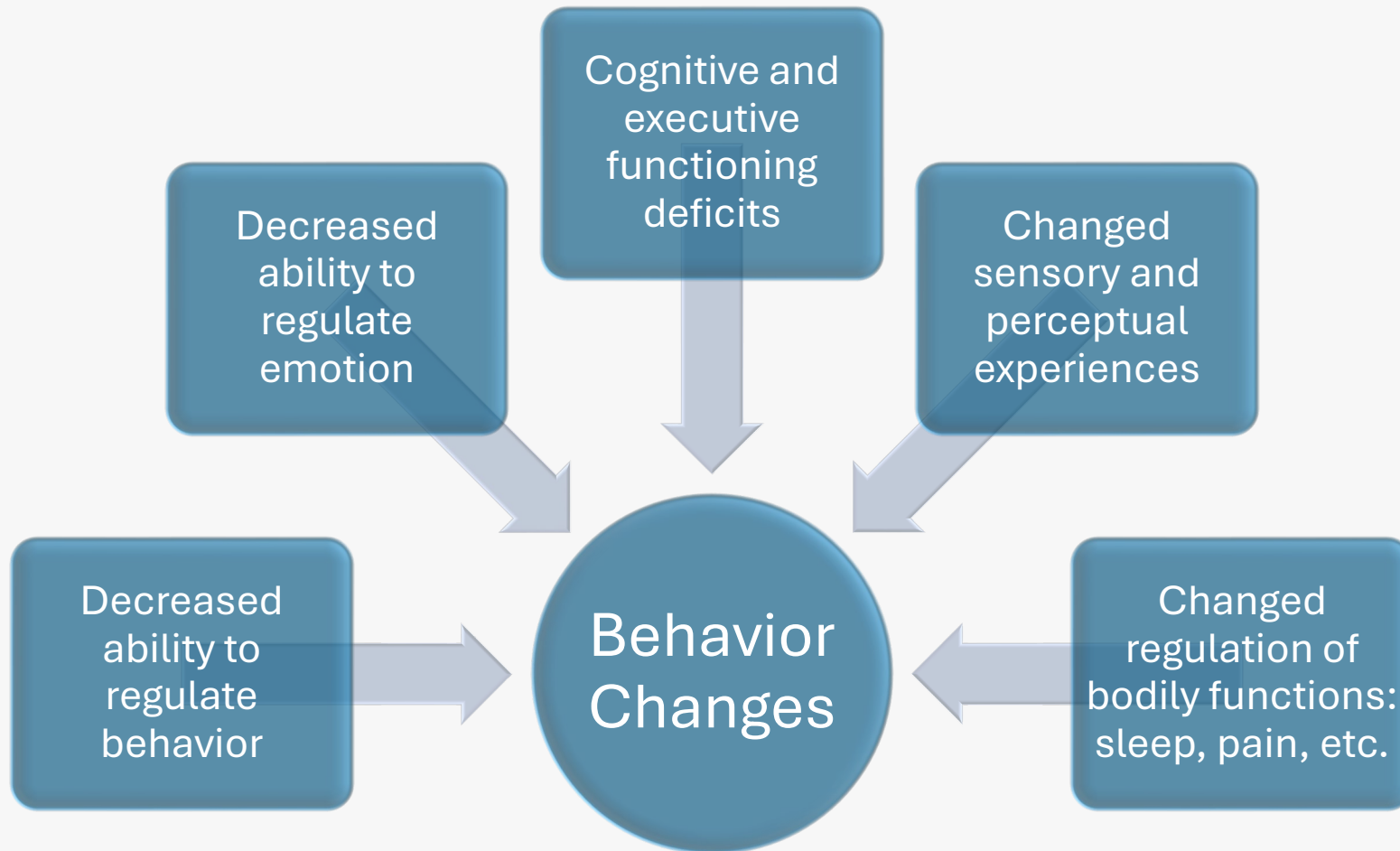
Summary Tips

Worksheets and Resources

Playbook's Core Message

- Behavior changes and challenges following TBI are associated with changes in the brain
- However, support from the environment can minimize the impact of behavior changes on function, participation in rehabilitation, and eventually return to the community.

Educate staff on brain-behavior associations



BEHAVIORAL APPROACHES

Applied Behavior Analysis

- Provides the basic tools for understanding and changing behavior
- Conceptual foundation in operant conditioning
- Functional analysis and measurement
- Strategies like shaping, fading, prompting

Positive Behavior Supports

- Focus on “changing the problem context , not problem behavior” (Carr et al, 2002)
- Stakeholder engagement and person-centered planning
- Focus on antecedents and natural consequences

Basics to optimize positive behavior

- **Team members' interactions with the patient AND family play a key role in fostering positive behaviors.**
- **Team members should:**
 - Actively monitor their own behavior and responses to the patient to ensure that they are having a positive impact.
 - Closely monitor cognition and agitation to provide early indications of possible emerging issues (e.g. medication side-effects, new medical conditions) that can impact behavior.
 - Set up the environment to support positive behaviors
 - Follow the “Basic Do’s and Don’ts to minimize the occurrence of most behavior challenges.

Be clear and to the point.

DOs:

- **Provide clear cues and direction to steer the person toward the positive behavior.**
- **Provide redirection if the person goes off task or starts to engage in negative behavior**

DON'Ts:

- **Don't assume the person knows the correct response just because they have done it before**
- **Avoid complicated, multi-step directions (when this is not the focus of a therapeutic activity)**
- **Don't follow behavior challenges with a reduction in demands, increased attention, or access to a preferred activity, object, or person.**

Be clear and to the point.

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- **Don't follow behavior challenges with a reduction in demands, increased attention, or access to a preferred activity, object, or person.**

Communicate respect and maximize engagement

DOs:

- Ensure your tone of voice is respectful and engaging
- Provide time for the patient to respond, do not rush
- Avoid multiple questions/instructions at once

DON'Ts:

- Avoid “talking down”, including talking too loudly, slowly or as if talking to a child
- Do not argue
- Avoid backhanded compliments (e.g., “You did it—now why can’t you do that all the time?”)

Provide a predictable and structured environment

DOs:

- **Be consistent in routines and staff**
- **When changes are needed, inform ahead and guide through change**
- **Incorporate activities and routines common to home**
- **Increase demands/complexity gradually**

DON'Ts:

- **Don't make sudden changes in schedules, expectations, staff**

Maximize cognitive functioning

DOs:

- **Tailor task length to attention span**
- **Simplify setting layout**
- **Limit auditory and visual input to one source at time**
- **Position self and materials to compensate for neglect**
- **Break down tasks into more manageable components**
- **Monitor cognitive functioning for decline**

DON'Ts:

- **Avoid sedating medications that can impair cognition**
- **Avoid chaotic, disorganized settings**
- **Avoid multiple people speaking at once**

Address physical needs

DOs:

- **Regulate sleep cycle**
- **Address pain**
- **Keep rooms at comfortable temperature**
- **Evaluate and treat underlying medical issues**
- **Address incontinence, constipation, dehydration**
- **Assess for medication side effects**

DON'Ts:

- **Don't discount the potential role of underlying medical conditions**
- **Don't ignore the patient and their input**

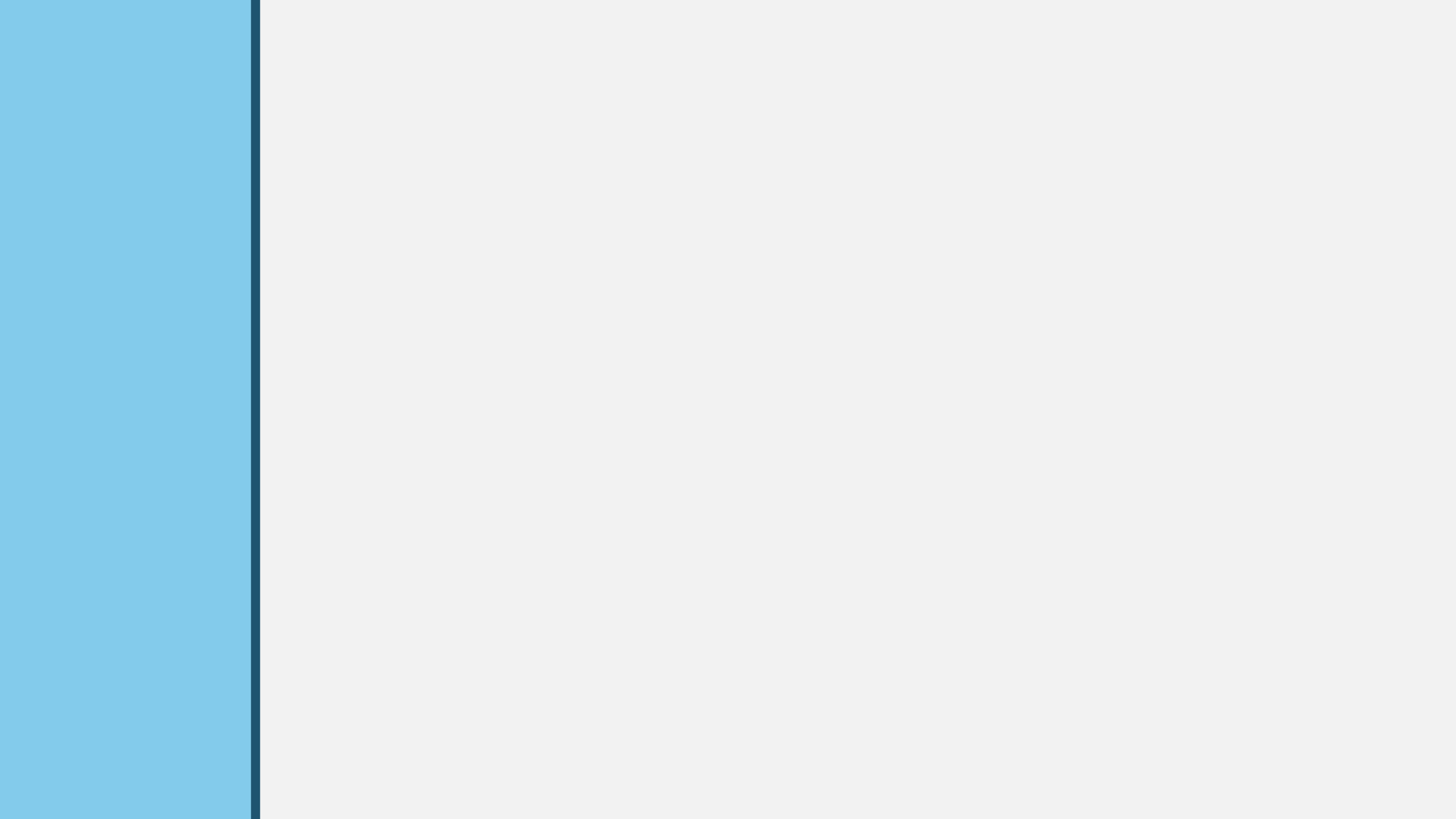
Address psychological needs

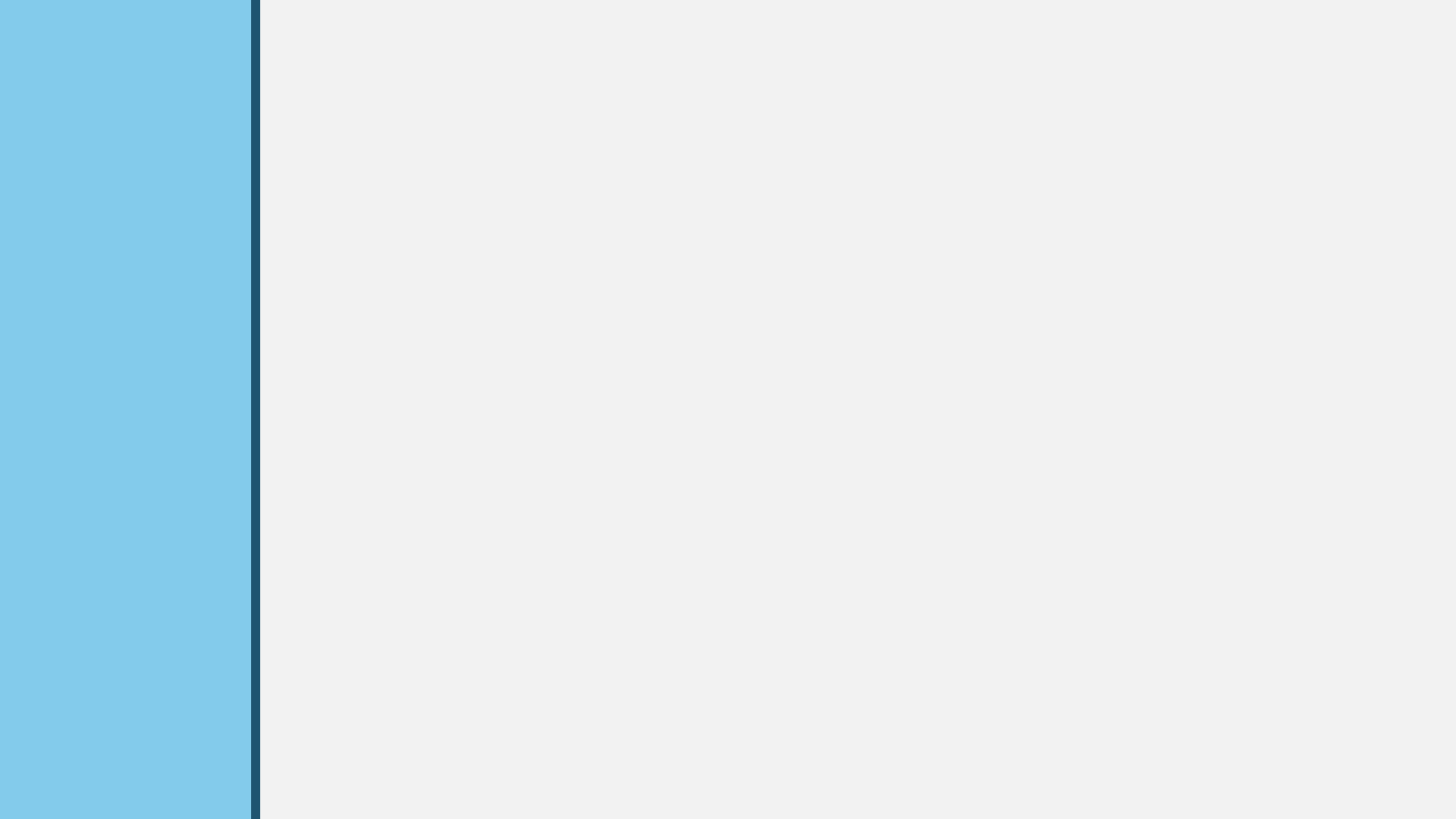
DOs:

- Evaluate for difficulties with adjustment to disability and provide support
- Celebrate the wins
- Incorporate positive influencers (e.g. family, friends).
- Keep the team informed, especially mental health providers, of any signs or concerns indicating psychological difficulties

DON'Ts:

- Do not take the person's actions personally.
- Don't diminish sociocultural issues that could influence adjustment to hospitalization.





Case example

- **Brandon sustained a TBI 8 weeks ago. Staff have noted that Brandon has been increasingly pushing staff. This has not led to any injury or falls, but staff are describing increasing safety concerns as his pushing is occurring daily and with increasing force.**
- **He is currently experiencing post-traumatic confusion/amnesia. Cognitive assessments indicate difficulties with delayed verbal response latencies, right visual field cut, right upper and lower sided weakness, and motor sequencing deficits.**

Definition of behavior

- **Physically pushing staff during hands-on care, that is more likely to occur on his left side/with his left hand.**
- **Pushing staff is less likely to occur on right side due to right visual field deficit and right sided weakness. However, Brandon will still push staff once he becomes aware they are delivering hand-on care.**

Observations

- **What does the behavior look like?** He pushes staff away with his hands and lower arms. This happens most often on his left side with his left hand, which is stronger than his right hand.
- **When is the pushing behavior most likely to occur?** During the delivery of any self-care activities, including ADLs (e.g. toileting, dressing, showering), or during transfer activities, or medical care tasks (e.g. wound care, medications). Whenever hands on care / touching of the patient occurs, Brandon is most likely to push staff, particularly with his left hand.
- **When is the pushing behavior least likely to occur?** When staff are on his right side, though he will still push staff on his right side when he is visually oriented in that direction. Less likely to occur during rehabilitation activities that do not require hands-on care. Less likely to occur with his mother.

What are the possible antecedents?

What are the possible antecedents?

- **Being touched by others**
- **Physical discomfort**
- **Vulnerable self-care activity**
- **Potential confusion about purpose of care task**

What are the possible functions of the behavior?

What are the possible functions of the behavior?

- **Escape/Avoidance:** Removal of uncomfortable stimuli as behavior is primarily occurring when providers are touching Brandon. Discomfort may be due to physical pain or poor understanding of the purpose of staff touching him.
 - Attention seeking or sensory needs are less likely functions of this behavior as pushing is only occurring when being touched.

Design a treatment plan

Design a treatment plan

- 1. Rule out potential unrecognized causes of pain with physiatry.**
- 2. Prior to touching Brandon, explain who you are, why you are there, and the task you need to perform in a slow and simple manner. Make eye contact at his level (versus standing over him).**
- 3. Ask for Brandon's permission prior to starting the task or activity.**
- 4. If need to deliver care on his right side, prompt him to turn his head so he can see you. Then follow steps 2-3 above.**
- 5. Verbalize each step you take and routinely ask him how he is doing. Ask about pain levels, privacy needs, or if a brief break is needed.**
- 6. Implement a system of positive reinforcement for non-pushing behavior, such as verbal praise, preferred activities, or small rewards.**

Troubleshooting

If Brandon continues to push staff at the same rate, consider:

- **Conduct a thorough re-evaluation to identify any underlying medical issues or sources of pain.**
- **Ensure that the current pain management plan is effective. Consider use of multimodal approach.**
- **Use adaptive equipment that facilitates independence and reduces the need for hands-on care.**
- **Modify Brandon's environment to minimize triggers and create a soothing, predictable routine that can help reduce anxiety and behavior incidents.**



Improving Access to Care for Persons with TBI

Implementing TeamBI

Preliminary Data on Indicators

- 300 brain injury treatment providers surveyed
- Survey responses indicated that facilitators for managing challenging behavior included:
 - Culture that prioritized staff collaboration
 - Specialized staff
- Barriers included:
 - Inconsistent treatment strategies
 - Ill-prepared, untrained workforce
- Another preliminary study suggested that staff training *improved confidence* in managing challenging behaviors

Who (what disciplines) should be leading Team-BI at your site?

Original model was led by Behavior Coordinator (mental health provider) and a Nurse Champion

- Who might be the Leads/Champions at your site?

Will the staff partners (the rehabilitation team) welcome Team-BI?

Staff partners will be expected to share responsibilities as well as provide input unique to their discipline.

- Will everyone be on board?
- If not, how can buy-in be facilitated?

Who will need to be engaged from upper-level leadership?

- What kinds of support will you need from leadership?
- What will persuade leadership to provide this support?

How will Team-BI be sustained after initial implementation?

STAR-VA is no longer fully operational despite sustainment plans.

- Why do you think it was difficult to sustain?
- What strategy(ies) might overcome barrier(s) for sustaining Team-BI?

Evidence-Based Rehabilitation for People with Disorders of Consciousness

Presenting Author:

Risa Nakase-Richardson, PhD

**Professor, Department of Neurosurgery, Brain and Spine, University
of South Florida, Tampa, FL USA**

**Associate Chief of Staff for Research, James A. Haley Veterans
Hospital, Tampa, FL USA**

Q&A



<https://www.menti.com/blyfe259fi6k>

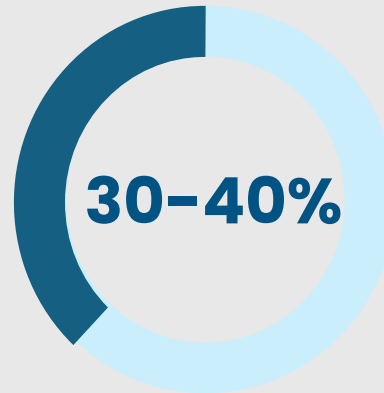
Disorders of Consciousness

DoC in the United States



More than **300,000** cases are reported annually of patients in a Vegetative State (VS)/Unresponsive Wakefulness Syndrome (UWS) and Minimally Conscious State (MCS).

Fins JJ, McMaster M, Gerber L, Giacino JT. The minimally conscious state: a diagnosis in search of an epidemiology. Arch Neurol 2007;64:1400-5.



Approximately **30–40%** of patients in a VS/UWS or MCS recover essential functional abilities (e.g., speech, command following).

Whyte JW, Nakase-Richardson R, Hammond FM, et al. Functional outcomes in traumatic disorders of consciousness: 5-year outcomes from the National Institute on disability and rehabilitation research traumatic brain injury model systems. Arch Phys Med Rehabil 2013; 94:1855-60.



A **multidisciplinary** approach and team should be utilized for patients who have a DoC.

Giacino J, Whyte J, Nakase-Richardson R, Katz D, Arciniegas DB, Blum S, Day K, Hammond F, Greenwald BD, Pape TB, Seel R, Rosenbaum A, Yablon S, Weintraub A, Zafonte RD, Zasler N. Minimum competency recommendations for programs that provide rehabilitation services for persons with disorders of consciousness: A position statement of the American Congress of Rehabilitation Medicine and National Institute on Disability, Independent Living and Rehabilitation Research Traumatic Brain Injury Model Systems. Arch Phys Med Rehabil, 2020;101(6):1072-89. doi: 10.1016/j.apmr.2020.01.013. PMID: 32087109

ACRM ENDORSED POSITION STATEMENT

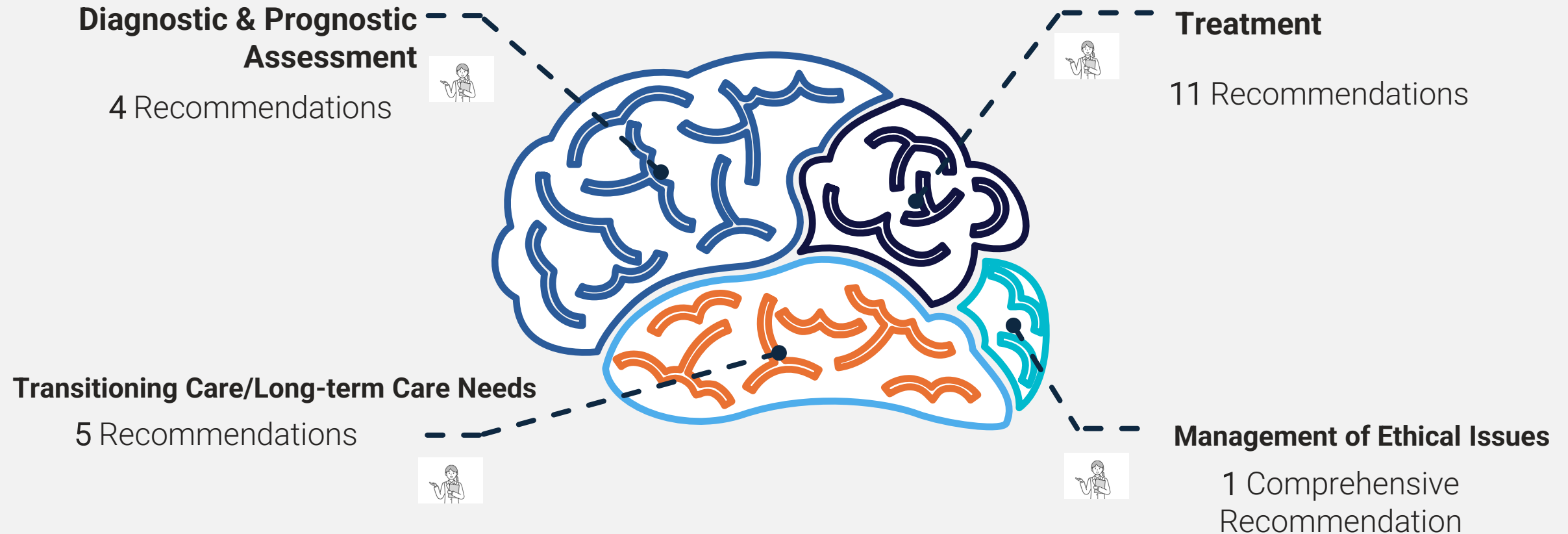
Minimum Competency Recommendations for Programs That Provide Rehabilitation Services for Persons With Disorders of Consciousness: A Position Statement of the American Congress of Rehabilitation Medicine and the National Institute on Disability, Independent Living and Rehabilitation Research Traumatic Brain Injury Model Systems



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Ronald T. Seel, PhD,^o Alan Weintraub, MD,^{p,q} Stuart Yablon, MD,^r Ross D. Zafonte, DO,^s
Nathan Zasler, MD^{t,u}

Minimal Standards for DoC-Focused Inpatient Rehabilitation

Within these 4 categories are recommendations for program administrators, clinicians, and payors who are involved in the care of patients who have a DoC



- **Modified Delphi – 3 Rounds of Voting for 21 Final Recommendations**
- **16 Subject Matter Experts - Multidisciplinary**

Diagnosis and Prognosis



- How should diagnostic and prognostic assessment of persons with DoC be approached? [1]

- **Recommendation 1:** Specialized programs for patients who have DoC should adopt systematic approach to diagnostic and prognostic assessment that relies on a careful review of the history, recent structural imaging data, and serial testing with validated behavioral measures.



- What factors should be considered when establishing diagnosis? [2]

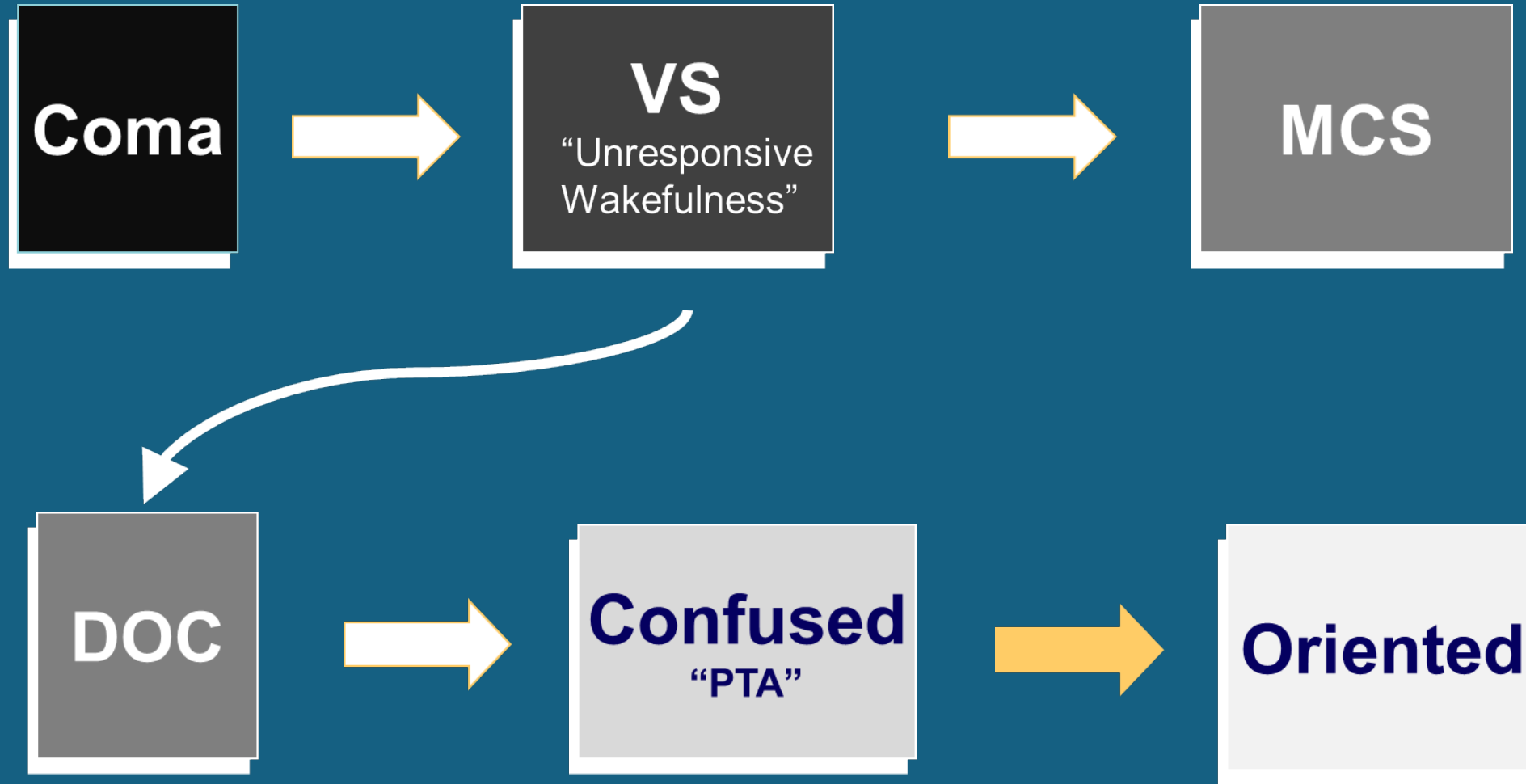
- **Recommendation 2:** Differential diagnosis among DoC (i.e., coma, VS/UWS, MCS) should be based on published, evidence-based guidelines, rely on diagnostic procedures that have acceptable reliability and validity, and consider common confounding facts such as sedating treatments and underlying sensory, motor, or cognitive impairments.



- Test selection
- Serial testing
- Factor in history

- Guideline-based
- Consideration for comorbid conditions in evaluation

Disorders of Consciousness



Disorders Associated with Impaired Consciousness

- **Cranial Trauma**
- **Cerebral Hemorrhage/Thrombosis/ Embolism**
- **Brain Abscess**
- **Hypertensive Encephalopathy**
- **Meningitis**
- **Subarachnoid Hemorrhage**
- **Intoxication (e.g., ETOH; Barbituate)**
- **CO Poisoning**
- **Anoxia**
- **Hypoglycemia**
- **Diabetic Coma**
- **Uremia**
- **Hepatic Coma**
- **Hypercapnia**
- **Severe Infections**
- **Epilepsy**

Differentiating Disorders of Consciousness

COMA

- Unconscious
- Sleep/Wake Cycles are ABSENT
- Motor: reflexes and posturing
- No auditory response
- No visual response
- No affect (emotion)

VEGETATIVE STATE

- Unconscious
- Sleep/Wake Cycles are PRESENT
- Motor: reflexive withdrawal from pain; occasional non-purposeful movement
- Auditory: reflexive startle
- Visual + startle; brief visual fixation
- Reflexive crying or smiling
- **Persistent/Permanent**

Minimally Conscious State

- Partial Consciousness
- Sleep/Wake cycles are present
- Motor:
 - Localizes to pain
 - Reach for objects
- Auditory:
 - Localizes to sound
 - Inconsistent command following
- Visual Function
 - SUSTAINED visual fixation
 - SUSTAINED visual pursuit
- Communication:
 - Vocalization (contingent)
 - Inconsistent/Unintelligible Verbalization/Gesture
- Emotion
 - Responsive affect

Emergenced from Minimally Conscious State

Functional **accurate communication**

- Consecutive evaluations of 100% accuracy to situational/orientation questions using a yes/no response (verbal or nonverbal) OR

Functional **use of two different objects**

- **Consecutive evaluations of two different object manipulations**

Disorders of Consciousness Summary

COMA

- Unresponsive
- No eye opening

VS

- Periods of Eye Opening
- Reflexive responses

MCS

- Inconsistent Responsiveness
 - Following commands
 - Localizing
 - Vocalizing or Verbalizing
 - Visual pursuit
 - Reaching
 - Gestures
 - Reactive Affect

EMERGED

- Yes/No Accuracy to 6 situational questions
- Functional Object Use x 2

Multi-Society Task Force. NEJM 1994; 330: 1499-508.

Unconscious or Partially Conscious

Giacino et al., (2002) Neurology, 58: 349-353.



Coma Scales

Diagnosis
Specific

Glasgow Coma Scale (Teasdale & Jennett, 1974)

No

The Ranchos Los Amigos Levels of Cognitive
Functioning (Hagen, 1972)

No

Coma Recovery Scale Revised (Giacino et al., 1991
& 2005)

Yes

Coma/Near Coma Scale (Rappaport et al., 1992)

No

Functional Independence Measure

No

Glasgow Outcome Scale – Extended

No

Disability Rating Scale (Rappaport et al, 1982)

No

ACRM DOC Task Force

Bedside Behavioral Assessment

May be considered with Minor reservations...

- CRS-R (Coma Recovery Scale – Revised)

Moderate reservations...

- WNNSP, SSAM, WHIM, DOCS, and SMART

Major Reservations

- CNC

Not Recommended at this time...

- RLS8₅, LOEW, and CLOCS
- FOUR, INNS, and GLS



American Congress of Rehabilitation Medicine Brain Injury –
Interdisciplinary Special Interest Group on Disorders of Consciousness
Task Group (2010). Assessment scales for disorders of consciousness:
evidence-based recommendations for clinical practice and research. Arch
Phys Med Rehabil, 91(12):1795-813

Misdiagnosis is Common

- N=103 acute/chronic cases of DOC

- Medical – Based
Clinical Consensus

- Serial Assessment
Clinical Research Team

N=44 VS → N=18 were MCS (41% error)

N=41 MCS → N=4 were E-MCS (10%)

N=18 unknown → N=16 were MCS (89%)



Schnakers C., Vanhaudenhuyse A., Giacino J., Ventura M., Boly M., Majerus S., Moomen G., Laureys S. Diagnostic accuracy of the vegetative and minimally conscious state: Clinical consensus versus standardized neurobehavioral assessment. BMC Neurology 2009, 9: 35-40.

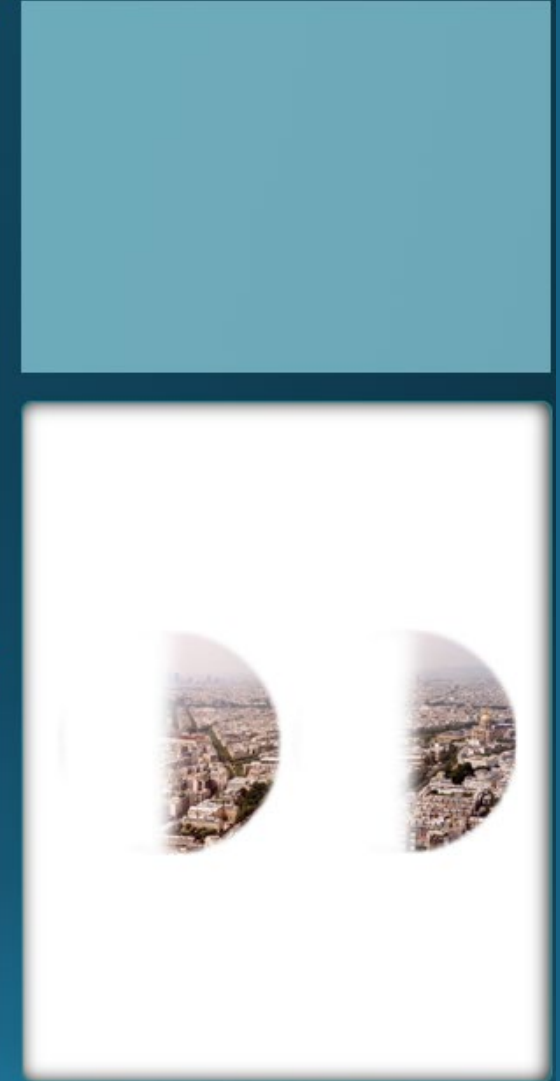
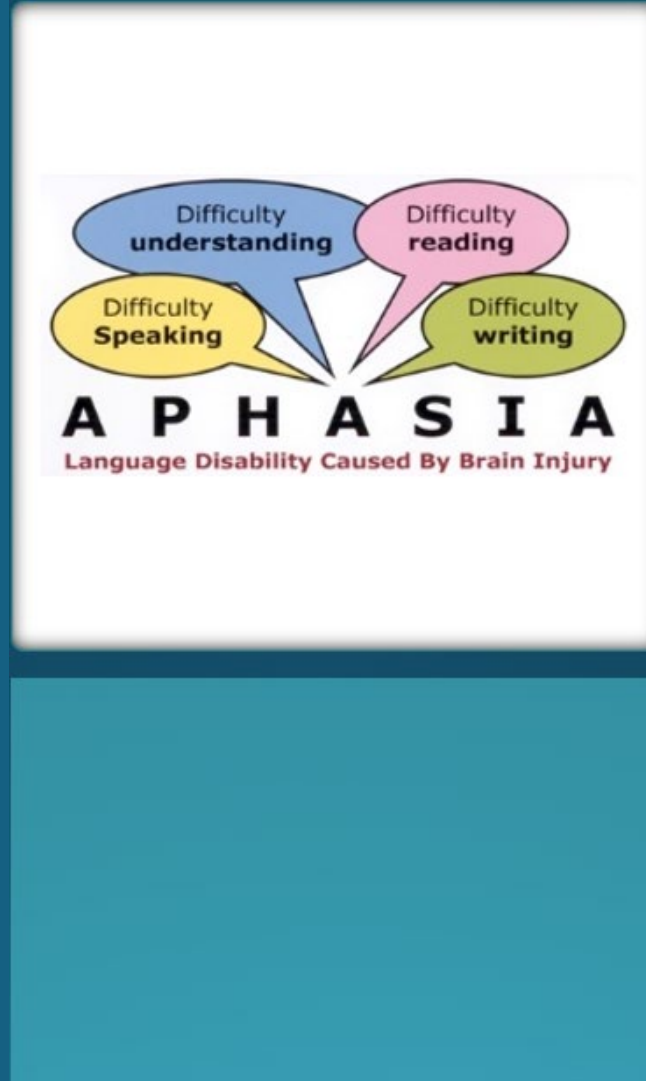
Anatomical Confounding Factors in Assessment

- Motor
 - Locked-in syndrome
 - Akinetic Mutism
 - Hemi-plegia / Hemi-paresis
 - Initiation, Coordination, and Discontinuation
- Sensory
 - Altered/Loss of Any Sensory Modality including:
 - Vision (Field and/or Quadrant Loss; Blurry Vision)
 - Hearing (loss or ringing sounds)
 - Smell



Anatomical Confounding Factors in Assessment

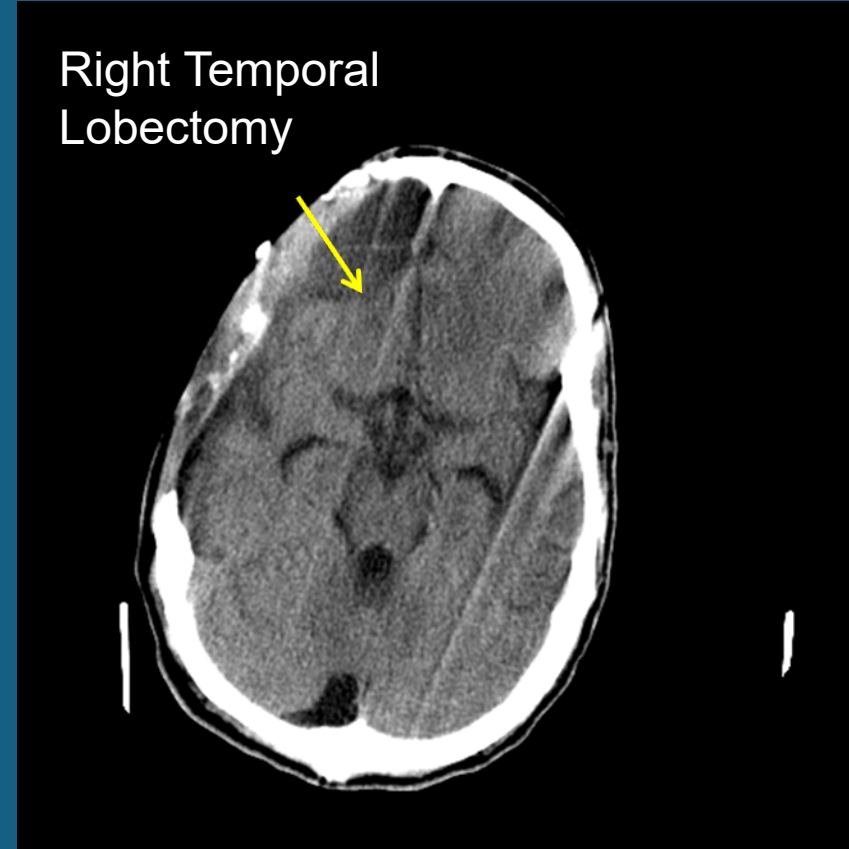
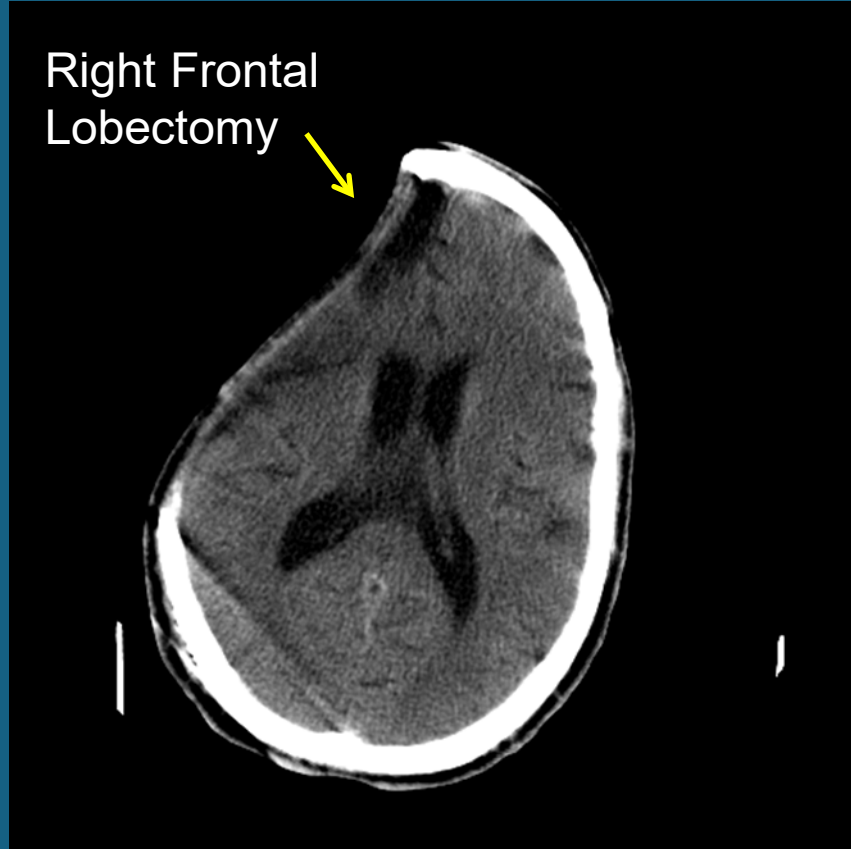
- Cognitive
 - Aphasia
 - Inattention
- Behavioral
 - Fluctuation
 - Neglect



DOC Case Illustration

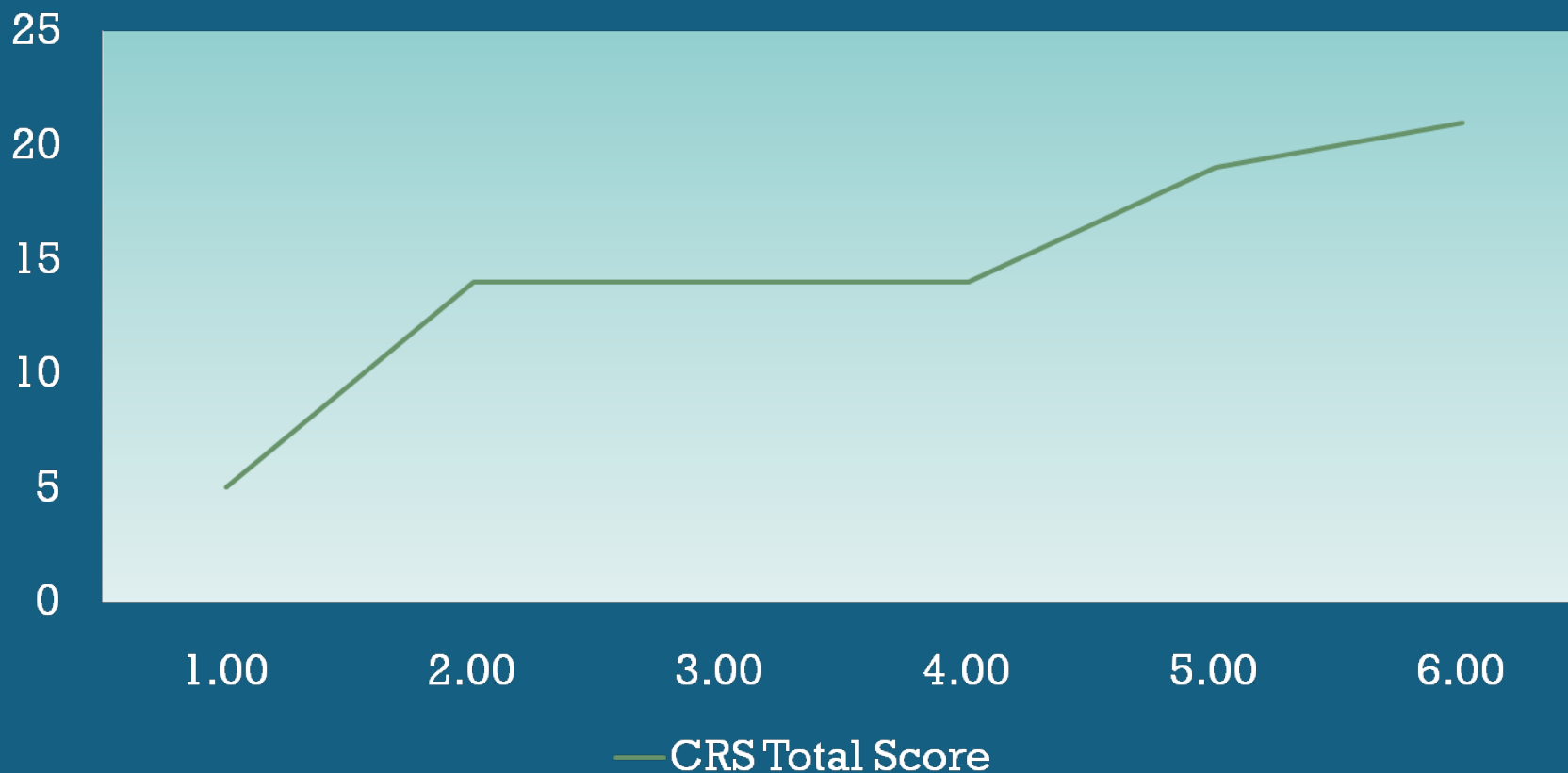
- History
 - 26 y/o, RH, SWM
 - 09/01-blast
 - GCS 3T
- Craniectomy – ICP mgt
 - 09/8 – R temporal lobectomy
 - 09/10 – R frontal lobectomy
- Injuries
 - R-penetrating TBI
 - R – Basilar skull fx; facial fx
 - R – globe injury
 - RUE burns
 - B hemopneumothorax
 - Musculoskeletal
 - Possible anoxia-face down

DOC Case Illustration



- Imaging supported Left Visual Field Cut
- Patient Admitted with diagnosis of Vegetative State

Serial Assessment: CRS Total Scores



Currently, Total Scores (across measures) tell you about recovery curves but do not inform you of the diagnosis.

Detailed CRS Subscales

Subscale	1	2	3	4	5	6	7
Auditory	0	4	2	2	3	4	4
Visual	0	<u>5</u>	5 ++	5	4	5	5
Motor	3	-	4	4	4	<u>5</u>	5 **
Oromotor	1	1	1	1	2	2	2
Comm	0	0	0	0	0	<u>1</u>	1
Arousal	1	2	2	2	2	2	4

++Met Criteria for MCS (tracking in RVF of Left Eye only Secondary to VF abnormalities & R Globe Injury)

****Met Criteria for Emerged from E-MCS (object use) – not accurate on yes/no responses yet using gestural communication.**

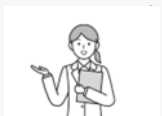
Diagnosis and Prognosis

- What factors should be considered when establishing prognosis for recovery of consciousness and functional improvement? [3]



- **Recommendation 3:** Prognostication in patients who have DoC should consider the best available evidence. When formulating prognosis, one must consider (1) predictors used, (2) outcome of interest; (3) time postinjury when the predictor is applied (e.g., 2 wk, 3 mo, 60 mo); and time postinjury when the outcome of interest will be assessed (e.g., 6, 12, 60 mo); and (4) degree of precision associated with prognostic forecast.

- What information should be provided to caregivers, families, and professional when discussing diagnosis and prognosis in persons with DoC? [4]



- **Recommendation 4:** Communication of diagnosis and prognosis should ensure that the clinical information provided (i.e., diagnostic features, prognostic indicators) is understandable and the limits of certainty afforded by the available evidence are described.

- Prognostication is multifactorial
- Prognostication is continuous

- Understandable
- Limitations acknowledged



<https://www.menti.com/blb9yu2sdyi5>

	Study Sample N=396
Age (quartiles)	21/28/42
Male	73%
Race	
White	67%
Black	22%
Hispanic	8%
Other	3%
Education	
<12 years	27%
≥ 12 years	48%
Missing	25%
Cause of Injury	
N Motor (%)	66%
ED GCS	3/3/6
Rehab Admit GCS	7/9/10
Acute LOS	21/31/41
Rehab LOS	29/47/72

Acute Rehabilitation Outcome N=396

- **N=271 (66%) FC**
 - **Median of 24 days post rehab admission**
 - **Median of 55 days post injury**
- **N=91 (23%) E-PTA**
- **N=264 (68%) DC-Comm**

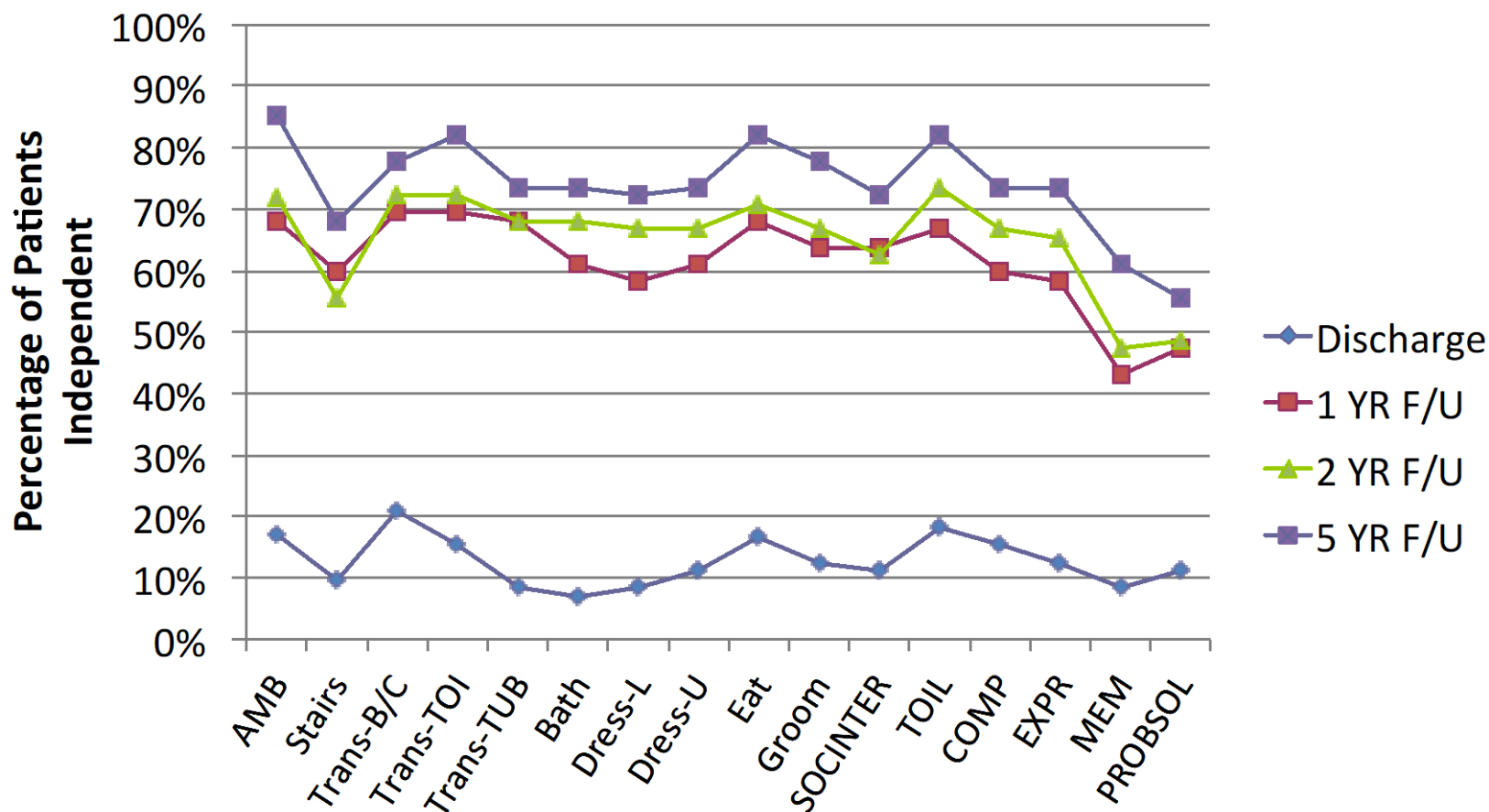
Nakase-Richardson R, Whyte J, Giacino JT, Pavawalla S, Barnett ST, Yablon SA, Sherer M, Kalmar K, Hammond F, Greenwald B, Horn LJ, Seel RT, McCarthy M, Tran J, Walker W. Longitudinal outcome of patients with disordered consciousness in the NIDRR TBI Model Systems Programs. *Journal of Neurotrauma*, 2012; 29(1):59-65

Nakase-Richardson R, Whyte J, Giacino JT, Pavawalla S, Barnett ST, Yablon SA, Sherer M, Kalmar K, Hammond F, Greenwald B, Horn LJ, Seel RT, McCarthy M, Tran J, Walker W. Longitudinal outcome of patients with disordered consciousness in the NIDRR TBI Model Systems Programs. *Journal of Neurotrauma*, 2012; 29(1):59-65



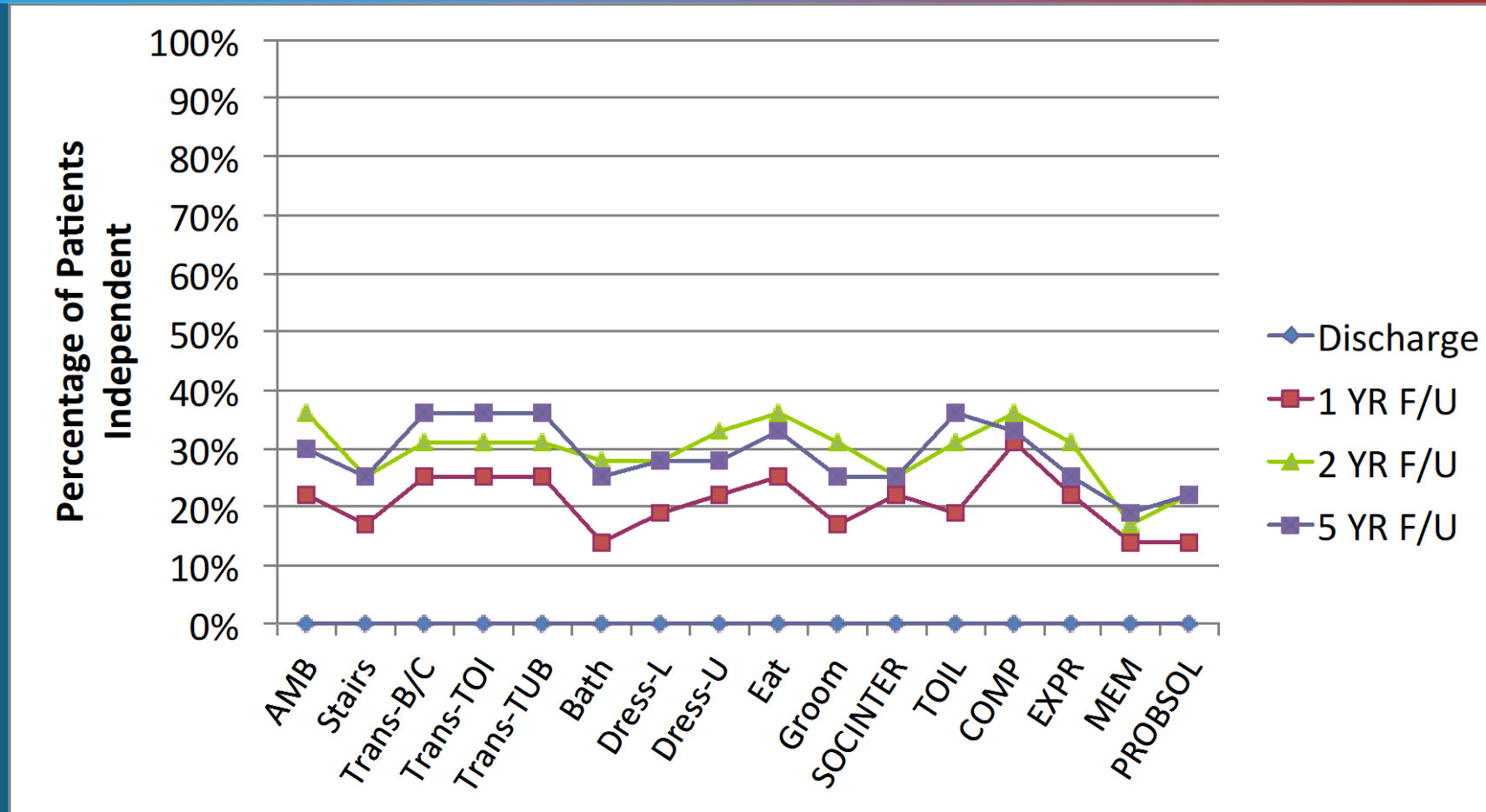
Measure	Discharge to 1 Year Comparison	1 to 2 Year Comparison	2 to 5 Year Comparison
DRS	44%	11%	4%
FIM – Motor	74%	6%	3%
FIM - Cognitive	76%	7%	6%
SRS (Supervision)	-----	11%	9%

Functional ADL Recovery Over 5 Years in Patients who Recovered Command-Following During Inpatient Rehab



Whyte J, Nakase-Richardson R, Hammond FM, McNamee S, Giacino JT, Kalmar K, Greenwald B, Yablon SA, Horn LJ. Functional outcomes in traumatic disorders of consciousness: 5-year outcomes from the NIDRR traumatic brain injury model systems. *Archives of Physical Medicine and Rehabilitation*, 2013; 94(10): 1855-60.

Functional ADL Recovery Over 5 Years in Patients who Failed to Recover Command-Following During Inpatient Rehab



Whyte J, Nakase-Richardson R, Hammond FM, McNamee S, Giacino JT, Kalmar K, Greenwald B, Yablon SA, Horn LJ. Functional outcomes in traumatic disorders of consciousness: 5-year outcomes from the NIDRR traumatic brain injury model systems. *Archives of Physical Medicine and Rehabilitation*, 2013; 94(10): 1855-60.

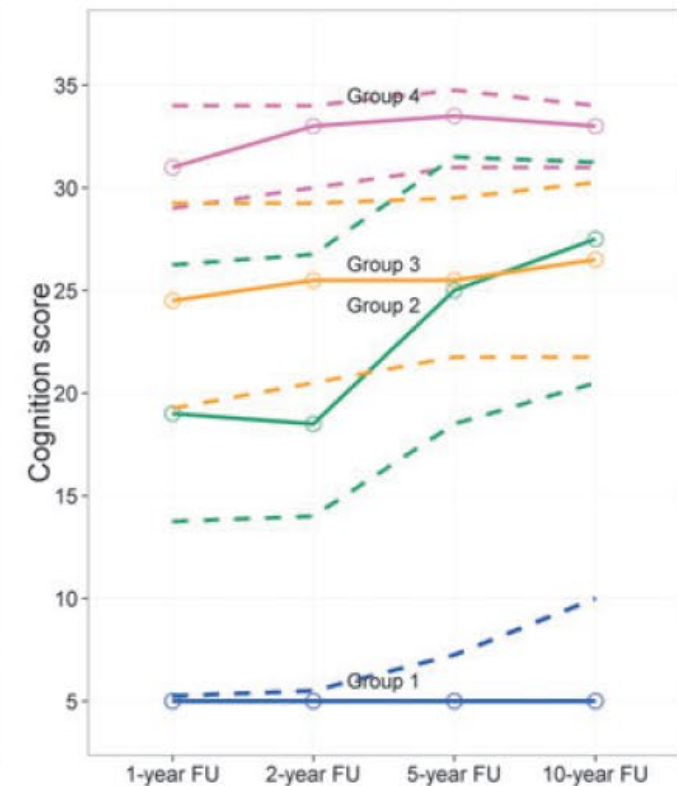
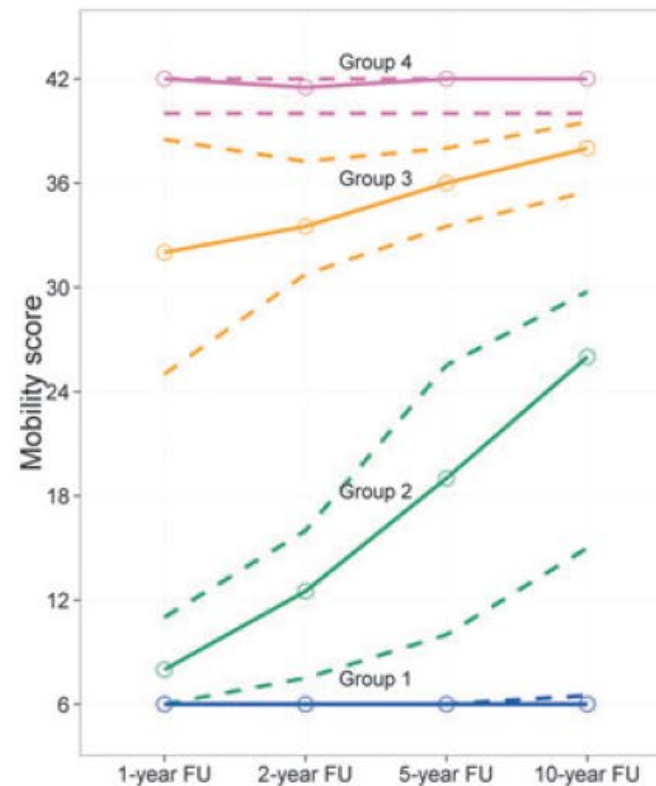
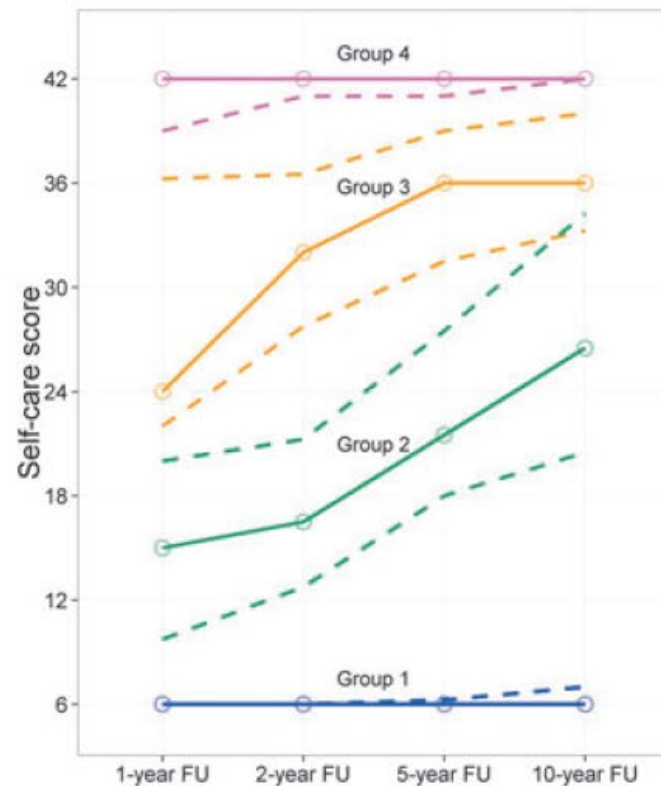


Disorders of Consciousness due to Traumatic Brain Injury: Functional Status Ten Years Post-Injury

Flora M. Hammond,¹ Joseph T. Giacino,² Risa Nakase Richardson,^{3,4} Mark Sherer,⁵ Ross D. Zafonte,⁶ John Whyte,⁷ David B. Arciniegas,⁸ and Xinyu Tang⁹

8

HAMMOND ET AL.



DOC Rehabilitation Treatment

- What specialized medical expertise is required to address common complications experienced by DOC? [5]
- **Recommendation 5:** Rehabilitation services in a DoC program should be provided by a multidisciplinary team of brain injury professionals whose members include, but are not limited to, physicians, **psychologists**, physical therapists, occupational therapists, speech language pathologists, nurses, and social workers, and whose efforts are focused on individualized cross-disciplinary treatment goals that enhance health, mobility, self-care, communication, and participation.
- What specialized medical expertise is required to manage the most common medical complications experienced by patients who have DoC? [6]
- **Recommendation 6:** An attending physician must be available onsite at least 5 days per week (with continuous on-call coverage) to oversee medical management; programs that accept patients on ventilators should additionally have a specialist in pulmonology onsite. The program should have established procedures for obtaining timely consultations from consultants in additional specialties not represented by the attending physician, including internal medicine, physiatry, neurology, neurosurgery, infectious disease, gastroenterology, ophthalmology, and otolaryngology, and established relations with specialists in each of these areas. Standard procedures must be in place to transfer patients with severe or life-threatening conditions to acute care or ICU services emergently.

- Team Composition
- Goals are health, mobility, self-care, communication, and participation

- Type of Providers
 - On-Site
 - Consultants
- Availability
- Emergent Care

DOC Rehabilitation Treatment

- What healthcare regimens should be incorporated into routine clinical management to maintain health? [7]
- **Recommendation 7:** Care regimens intended to promote physical health and mitigate complications should be initiated immediately on admission, updated at least weekly and streamlined where possible to reduce the burden of future care. At a minimum, these regimens should focus on adequate nutrition; respiratory hygiene and aspiration risk; bladder and bowel management; skin integrity; contracture prevention, positioning, and tone management; prevention of venous thrombosis; and optimizing sleep or wake patterns.
- What routine evaluations should occur on admission to identify barriers to recovery or to its detection? [8]
- **Recommendation 8:** On admission, a comprehensive neurosensory examination should be performed to evaluate for previously unrecognized auditory, visual, somatosensory, and motor impairments; prescribed medications should be reviewed so those with potentially sedating properties can be stopped or replaced with less sedating alternatives where possible; and brain imaging studies to define residual neuropathology and screen for late complications should be reviewed and updated if appropriate.

- **DOC-Specific Care Regimens**
- **Initiated on Admit and Regularly Updated**

- **Tests Ordered**
- **Medication Review**
- **Identify/Treat Late Complications**

DOC Rehabilitation Treatment

- Question: What additional evaluations should be considered for patients who show decline in function? [9]
- **Recommendation 9:** Programs should have protocols that initiate timely medical evaluation in response to a decline or plateau in clinical status and function, or in the presence of clinical conditions that present risks for worsened outcomes. These evaluations should address possible disorders including new intracranial complications, subclinical seizures, occult infections, metabolic disturbances, or adverse medication effects, and will typically entail neuroimaging, electrophysiological assessments, laboratory studies, and/or comprehensive medication review.



- Protocol of management based on trajectory
- Address medical comorbidities hindering neurologic recovery

DOC Rehabilitation Treatment

- **Question:** What interventions should be considered to optimize current function and facilitate neurologic and functional recovery? [10-12]
- **Recommendation 10:** Environmental factors (eg, positioning, lighting, time of day, level of stimulation, distractions, restraint) that may influence arousal and neurocognitive performance should be systematically evaluated for their effect on behavior.
- **Recommendation 11:** Pharmacologic or other interventions that have been systematically reviewed and found to be efficacious in enhancing arousal, behavioral responsiveness, or rate of recovery should be strongly considered when developing a plan of care. Other interventions, whose efficacy or inefficacy has not been determined in such studies, can be considered for use when the risk of adverse effects is low and a reasonable plan is in place to determine the positive and negative effects of treatment in the individual.
- **Recommendation 12:** A variety of strategies, technologies, and adaptive equipment should be available to enhance the detection of emerging neurobehavioral capacities and augment their transformation into functional abilities such as communication and environmental interactions. There should be a systematic approach to assessment of patient capacities that can guide selection of appropriate technology and to assessing the functional effect of the technology selected.

- Evaluate environmental factors influencing behavioral responsiveness

- EBT for wakefulness
- Approach for Non-EBT

- Technology availability
- Technology indication and outcome

DOC Rehabilitation Treatment

- How should rehabilitative interventions intended to enhance recovery be monitored? [13]
- **Recommendation 13:** When monitoring recovery in individual patients, validated measures should be used to establish level of performance at baseline, rate, and trajectory of recovery, degree of disability, and response to individualized treatment. The frequency of assessment and review of results should be sufficient to address the question(s) of interest.



- Validated Measures
- Timing of Measures
- Relevance

DOC Rehabilitation Treatment

- How should rehabilitation programs specializing in management of patients who have DoC ensure provision of high-quality rehabilitation care? [14-15]
- **Recommendation 14:** DoC programs should have a well-defined plan for staff education and training to ensure that assessment and treatment interventions designed for patients and caregivers address primary areas of need and are based on the best available evidence.
- **Recommendation 15:** Systems for quality improvement (QI) that rely on consistent assessment measures and prespecified performance benchmarks should be in place. Review of QI data should be performed at least twice each year. QI measures may include commercially available assessments, locally developed assessments, or a combination of both. Program performance benchmarks should be established to address patient outcomes, caregiver needs, and operational program processes.

- Plan for DOC Staff Education & Training
- Address Needs of Patients and Caregivers
- Evidence-Based Care

- Quality Improvement System
- Twice Annual Benchmark Review
- Focus: Patient, Caregiver, & Process

Transitioning Care/Long-term Care Needs

Treatment Transition

Recommendation #16

When patients who have a DoC completely recover consciousness and if certain milestones are met, then treatment strategies should start to focus on regaining independence and their ability to perform basic living activities.

Discharge Preparation

Recommendation #17

Determining whether a patient is ready to transition to a less-intensive level of care is based on assessment rather than a time-frame. When there is a decline or little change in medical and evaluation needs, then transition of care should be considered.

Recommendation #18

Continuity of care is integral when transitioning patients who have DoC. Both a detailed discharge summary of their clinical status and supporting contact information should be made available.



Caregivers

Recommendation #19

In order to address caregivers needs guidelines should be set in place and consulted. Information should educate and train caregivers on level of consciousness, prognosis, care needs, and other resources.

Recommendation #20

DoC programs should implement an approach that addresses caregivers informational, instrumental, and emotional needs.

Ethics

■ What policies and procedures should be available to assist with the identification and reconciliation of ethical issues that may arise during the course of rehabilitation?

■ **Recommendation 21:** Policies and procedures should be in place that address

- 1) identification of decision-making surrogates,
- 2) guardianship,
- 3) determination of do-not-resuscitate (DNR) status,
- 4) use of palliative care pathways,
- 5) withdrawal of life-sustaining treatment, and
- 6) when ethics consultations should be obtained.

■ Policy and Procedures In Place to Address Common DOC Ethical Issues

BEST PRACTICES GUIDELINES

THE MANAGEMENT OF TRAUMATIC BRAIN INJURY



The benefits of early rehabilitation are optimized when rehabilitation specialists are integrated into the trauma team. The multidisciplinary team needs to include, but is not limited to, PM&R physicians, nurses, PT, OT, SLP, psychologists/neuropsychologists, and social workers.

These guidelines include new evidence and novel insights, including on:

- **Advanced neuromonitoring:** New recommendations for the use of advanced tools to improve monitoring of intracranial pressure and cerebral oxygenation
- **Biomarkers in TBI diagnosis:** The inclusion of emerging blood-based biomarkers to help identify the severity of brain injury and guide imaging decisions
- **Tiered intracranial pressure (ICP) management:** Recommendations to prevent secondary brain injury, with specific interventions based on the severity of the condition
- **Comprehensive rehabilitation:** Recommendations for early multidisciplinary rehabilitation, including physical, cognitive, and psychological therapies
- **Seizure prophylaxis medication:** New evidence supporting the use of prophylactic antiseizure medication for high-risk TBI patients to prevent early post-traumatic seizures

Practice guideline update recommendations summary: Disorders of consciousness

Report of the Guideline Development, Dissemination, and Implementation Subcommittee of the American Academy of Neurology; the American Congress of Rehabilitation Medicine; and the National Institute on Disability, Independent Living, and Rehabilitation Research

Joseph T. Giacino, PhD, Douglas I. Katz, MD, Nicholas D. Schiff, MD, John Whyte, MD, PhD, Eric J. Ashman, MD, Stephen Ashwal, MD, Richard Barbano, MD, PhD, Flora M. Hammond, MD, Steven Laureys, MD, PhD, Geoffrey S.F. Ling, MD, Risa Nakase-Richardson, PhD, Ronald T. Seel, PhD, Stuart Yablon, MD, Thomas S.D. Getchius, Gary S. Gronseth, MD, and Melissa J. Armstrong, MD, MSc

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Comprehensive systematic review update summary: Disorders of consciousness

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American Academy of
Neurology
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Table 1 Recommendation statements^a for overall care and diagnosis for adults with a prolonged disorder of consciousness (DoC)

Recommendation number	Recommendation statement and level
1	Clinicians should refer patients with DoC who have achieved medical stability to settings staffed by multidisciplinary rehabilitation teams with specialized training to optimize diagnostic evaluation, prognostication, and subsequent management, including effective medical monitoring and rehabilitative care (Level B).
2a	Clinicians should use standardized neurobehavioral assessment measures that have been shown to be valid and reliable (such as those recommended by the ACRM) to improve diagnostic accuracy for the purpose intended (Level B based on importance of outcomes and feasibility).
2b	To reduce diagnostic error in individuals with prolonged DoC after brain injury, serial standardized neurobehavioral assessments should be performed with the interval of reassessment determined by individual clinical circumstances (Level B based on cogency, feasibility, and cost relative to benefit).
2c	Clinicians should attempt to increase arousal before performing evaluations to assess level of consciousness anytime diminished arousal is observed or suspected (Level B based on importance of outcomes).
2d	Clinicians should identify and treat conditions that may confound accurate diagnosis of a DoC prior to establishing a final diagnosis (Level B based on feasibility and cost).
2e	In situations where there is continued ambiguity regarding evidence of conscious awareness despite serial neurobehavioral assessments, or where confounders to a valid clinical diagnostic assessment are identified, clinicians may use multimodal evaluations incorporating specialized functional imaging or electrophysiologic studies to assess for evidence of awareness not identified on neurobehavioral assessment that might prompt consideration of an alternate diagnosis (Level C based on assessment of benefit relative to harm, feasibility, and cost relative to benefit).
2f	In situations where there is no behavioral evidence of consciousness on clinical examination but functional neuroimaging or electrophysiologic testing suggests the possibility of preserved conscious awareness, frequent neurobehavioral reevaluations may be conducted to identify emerging signs of conscious awareness (Level C based on feasibility) and decisions to reduce the intensity of rehabilitation treatment may be delayed for those individuals receiving active rehabilitation management (Level C based on variation in patient preferences and cost relative to net benefit), with the length of time over which these are done determined by an agreement between the treating clinician and the health care proxy given the lack of evidence to provide guidance.

Table 2 Recommendation statements for prognosis for adults with a prolonged disorder of consciousness (DoC)

Recommendation number	Recommendation statement and level
3	When discussing prognosis with caregivers of patients with a DoC during the first 28 days postinjury, ^a clinicians must avoid statements that suggest these patients have a universally poor prognosis (Level A).
4	Clinicians caring for patients with prolonged DoC should perform serial standardized behavioral evaluations to identify trends in the trajectory of recovery that are important for establishing prognosis (Level B).
5	Posttraumatic VS/UWS: Clinicians should perform the DRS at 2–3 months postinjury (Level B) and may assess for the presence of P300 at 2–3 months postinjury (Level C based on feasibility) or assess EEG reactivity at 2–3 months postinjury (Level C based on feasibility) to assist in prognostication regarding 12-month recovery of consciousness for patients in traumatic VS/UWS. Clinicians should perform MRI 6–8 weeks postinjury to assess for corpus callosal lesions, dorsolateral upper brainstem injury, or corona radiata injury in order to assist in prognostication regarding remaining in PVS at 12 months for patients in traumatic VS/UWS (Level B). Clinicians should perform a SPECT scan 1–2 months postinjury to assist in prognostication regarding 12-month recovery of consciousness and degree of disability/recovery for patients in traumatic VS/UWS (Level B). Clinicians may assess for the presence of higher level activation of the auditory association cortex using BOLD fMRI in response to a familiar voice speaking the patient's name to assist in prognostication regarding 12-month (postscan) recovery of consciousness for patients in traumatic VS/UWS 1–60 months postinjury (Level C based on feasibility, cost).
6	Nontraumatic, postanoxic VS/UWS: Clinicians should perform the CRS-R (Level B) and may assess SEPs (Level C based on feasibility) to assist in prognostication regarding recovery of consciousness at 24 months for patients in nontraumatic postanoxic VS/UWS.
7	Given the frequency of recovery of consciousness after 3 months in patients in nontraumatic VS/UWS, and after 12 months in patients with traumatic VS/UWS (including some cases emerging from MCS), use of the term permanent VS should be discontinued. After these time points, the term chronic VS (UWS) should be applied, accompanied by the duration of the VS/UWS (Level B).
Prognostic counseling recommendations	
8	Clinicians should counsel families that MCS diagnosed within 5 months of injury and traumatic etiology are associated with more favorable outcomes and VS/UWS and nontraumatic DoC etiology are associated with poorer outcomes, but individual outcomes vary and prognosis is not universally poor (Level B based on importance of outcomes).
9	In patients with a prolonged DoC, once a prognosis has been established that indicates a likelihood of severe long-term disability, clinicians must counsel family members to seek assistance in establishing goals of care and completing state-specific forms regarding medical decision-making (e.g., MOLST forms), if not already available, applying for disability benefits, and starting estate, caregiver, and long-term care planning (Level A).
10	When patients enter the chronic phase of VS/UWS (i.e., 3 months after non-TBI and 12 months after TBI), prognostic counseling should be provided that emphasizes the likelihood of permanent severe disability and the need for long-term assistive care (Level B).

Table 3 Recommendation statements for care and treatment for adults with a prolonged disorder of consciousness (DoC)

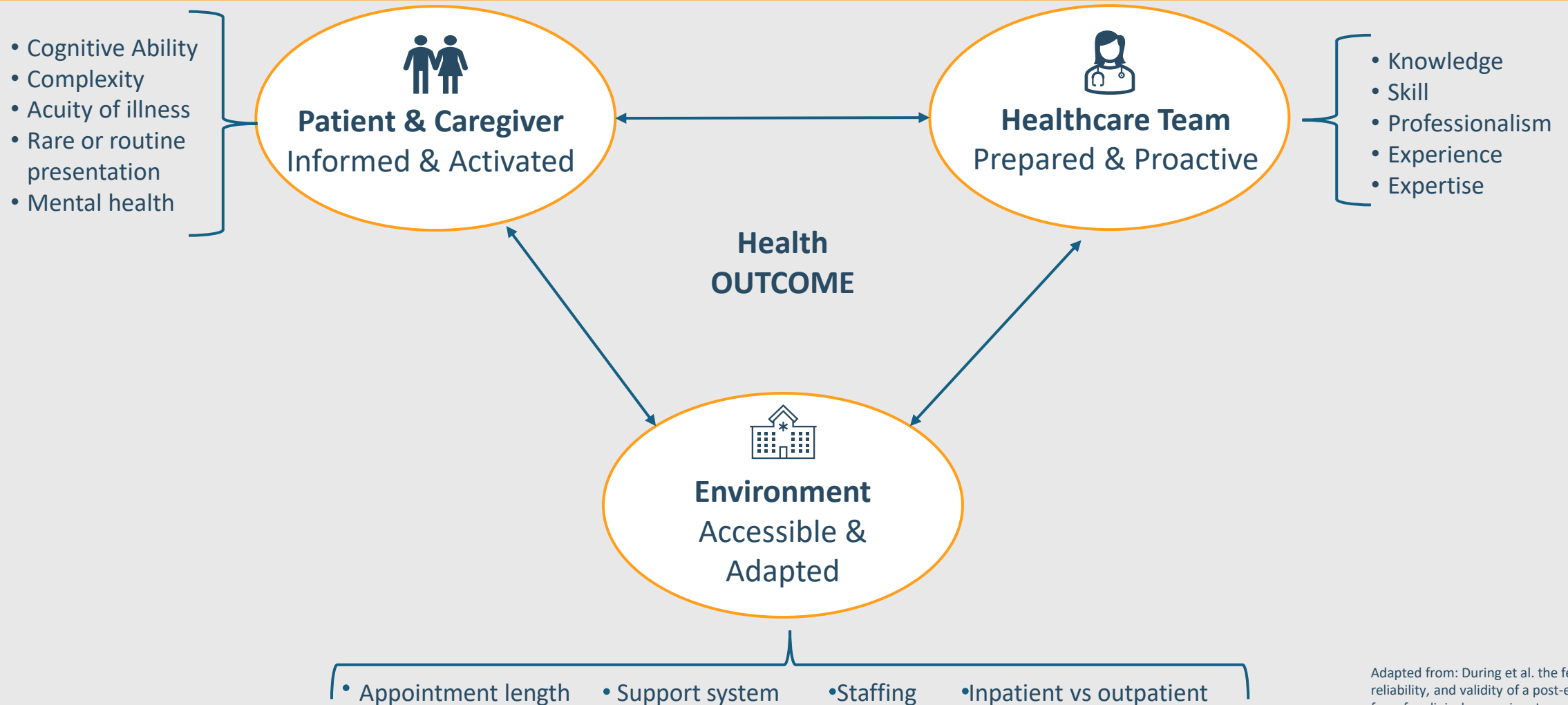
Recommendation number	Recommendation statement and level
11	Clinicians must identify patient and family preferences early and throughout provision of care to help guide the decision-making process for persons with prolonged DoC (Level A).
12	Clinicians should be vigilant to the medical complications that commonly occur during the first few months after injury among patients with DoC and, thus, should utilize a systematic assessment approach to facilitate prevention, early identification, and treatment (Level B).
13	Clinicians should assess individuals with a DoC for evidence of pain or suffering and should treat when there is reasonable cause to suspect that the patient is experiencing pain (Level B), regardless of level of consciousness. Clinicians should counsel families that there is uncertainty regarding the degree of pain and suffering that may be experienced by patients with a DoC (Level B).
14	Clinicians caring for patients with traumatic VS/UWS or MCS who are between 4 and 16 weeks postinjury should prescribe amantadine 100–200 mg twice daily to hasten functional recovery and reduce degree of disability in the early stages of recovery after determining there are no medical contraindications or other case-specific risks for use (Level B).
15	Clinicians should counsel families about the limitations of existing evidence concerning treatment effectiveness and the potential risks and harms associated with interventions that lack evidentiary support (Level B). When discussing nonvalidated treatments, clinicians should provide evidence-based information regarding the projected benefits and risks of a particular treatment and the level of uncertainty associated with the proposed intervention, keeping in mind that families and caregivers are often in distress and vulnerable (Level B). Clinicians should counsel families that, in many cases, it is impossible to discern whether improvements observed early in the course of recovery were caused by a specific intervention or spontaneous recovery (Level B).

Abbreviations: MCS = minimally conscious state; UWS = unresponsive wakefulness syndrome; VS = vegetative state.

Table 4 Recommendation statements for care for children with a prolonged disorder of consciousness (DoC)

Recommendation number	Recommendation statement and level
16	Clinicians should treat confounding conditions, increase arousal prior to diagnostic assessments, use valid and reliable standardized behavioral assessments (particularly those targeting pediatric populations), and conduct serial assessments to improve diagnostic accuracy in children with prolonged DoC (Level B).
17	Clinicians should counsel families that the natural history and prognosis of children with prolonged DoC is not well-defined and that there are no current evaluations established to improve prognostic accuracy in this population (Level B).
18	Clinicians should counsel families that there are no established therapies for children with a prolonged DoC (Level B).

Active Engagement in Healthcare



Thank you

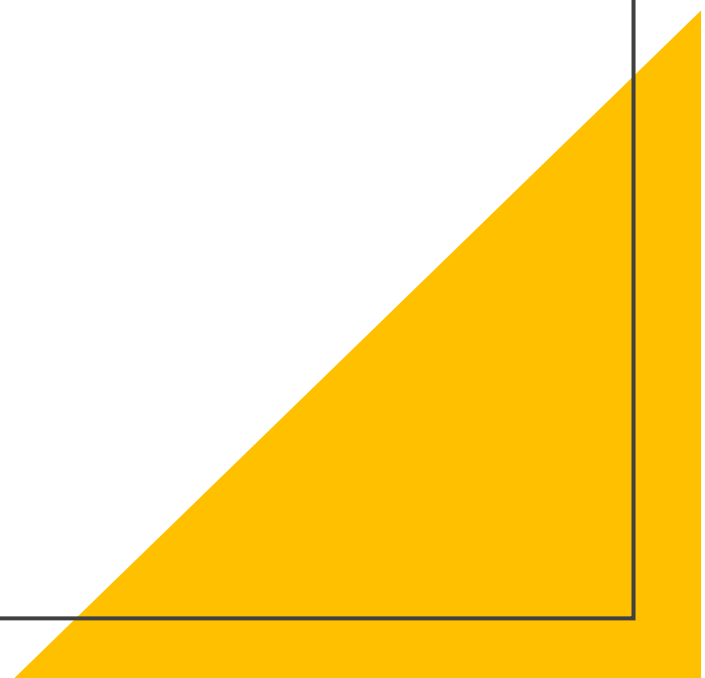
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Evidence-Based Cognitive Rehabilitation

November 5, 2025

Presenting Author:

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A large yellow triangle is positioned in the bottom right corner of the slide, pointing towards the top right.

Learning Objectives

1. Describe several evidence-based approaches to use in cognitive rehabilitation in persons with acquired brain injury.
2. Describe the role of psychologists in rehabilitation following severe neurologic injury.

Definition of Cognitive Rehabilitation

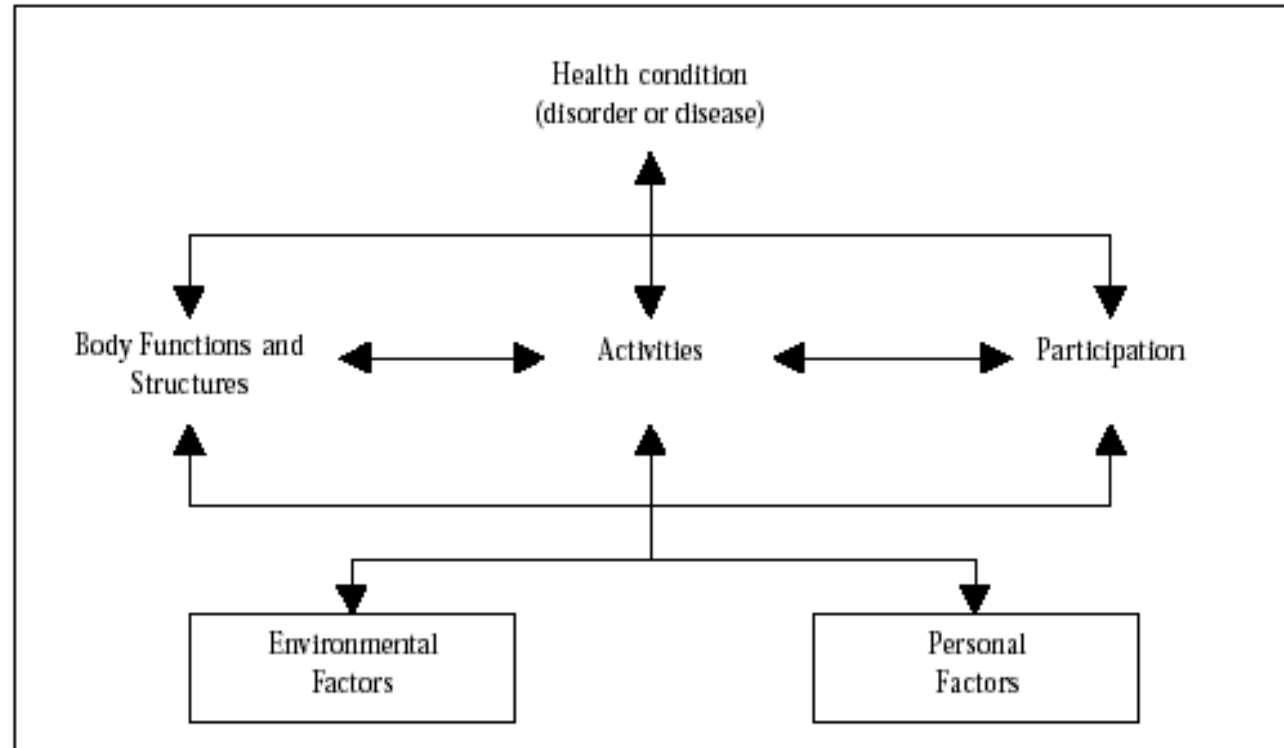
- *Cognitive rehabilitation is a system of therapeutic activities, based on brain- behavior relationships, directed to achieve functional change by:*
- Re-establishing or reinforcing previously learned patterns of behavior
- Establishing new patterns of cognitive activity through external compensatory mechanisms
- Enabling persons to adapt to their cognitive disability to improve overall **functioning**



Harley, J. P., C. Allen, T. L. Braciszewski, K. D. Cicerone, C. Dahlberg, S. Evans, M. Foto, W. A. Gordon, D. Harrington, W. Levin, J. F. Malec, S. Millis, J. Morris, C. Muir, J. Richert, E. Salazar, D. A. Schiavone, and J. S. Smigelski. 1992. Guidelines for cognitive rehabilitation. *NeuroRehabilitation* 2(3):62-67.

International Classification of Functioning, Disability, and Health (ICF) Integrated Biopsychosocial Model

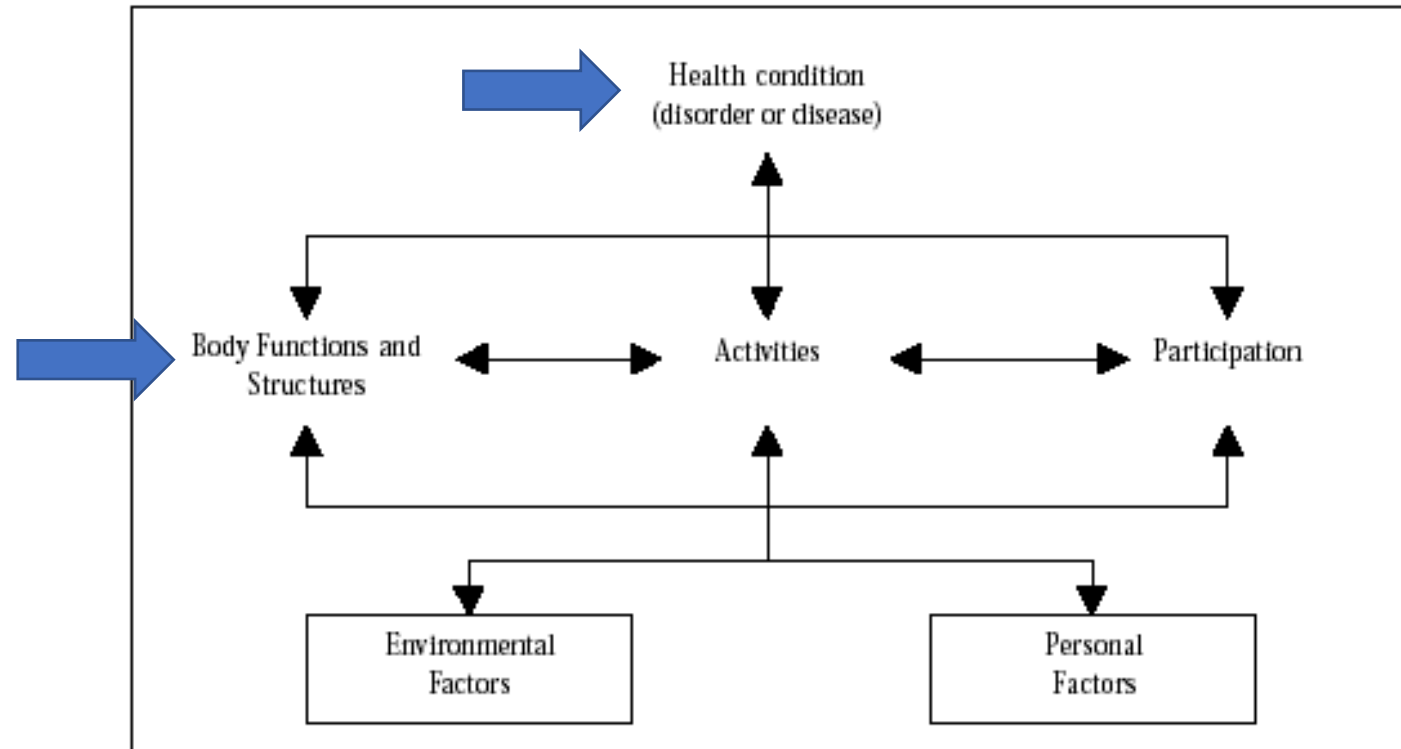
World Health Organization



- Chan, F., Gelman, J. S., Ditchman, N., Kim, J.-H., & Chiu, C.-Y. (2009). The World Health Organization ICF model as a conceptual framework of disability. In F. Chan, E. Da Silva Cardoso, & J. A. Chronister (Eds.), *Understanding psychosocial adjustment to chronic illness and disability: A handbook for evidence-based practitioners in rehabilitation* (pp. 23–50). Springer Publishing.

International
Classification of
Functioning,
Disability, and Health
(ICF)
Integrated
Biopsychosocial
Model

World Health Organization



 = Area of focus in most medical evaluations

Definition of Functioning

Functioning is the **lived experience** of health

Functioning **is associated** with one or more health condition.

Functioning **is not the direct consequence** of a health condition.

Functioning **is the product of the interaction** between a health condition and contextual factors.

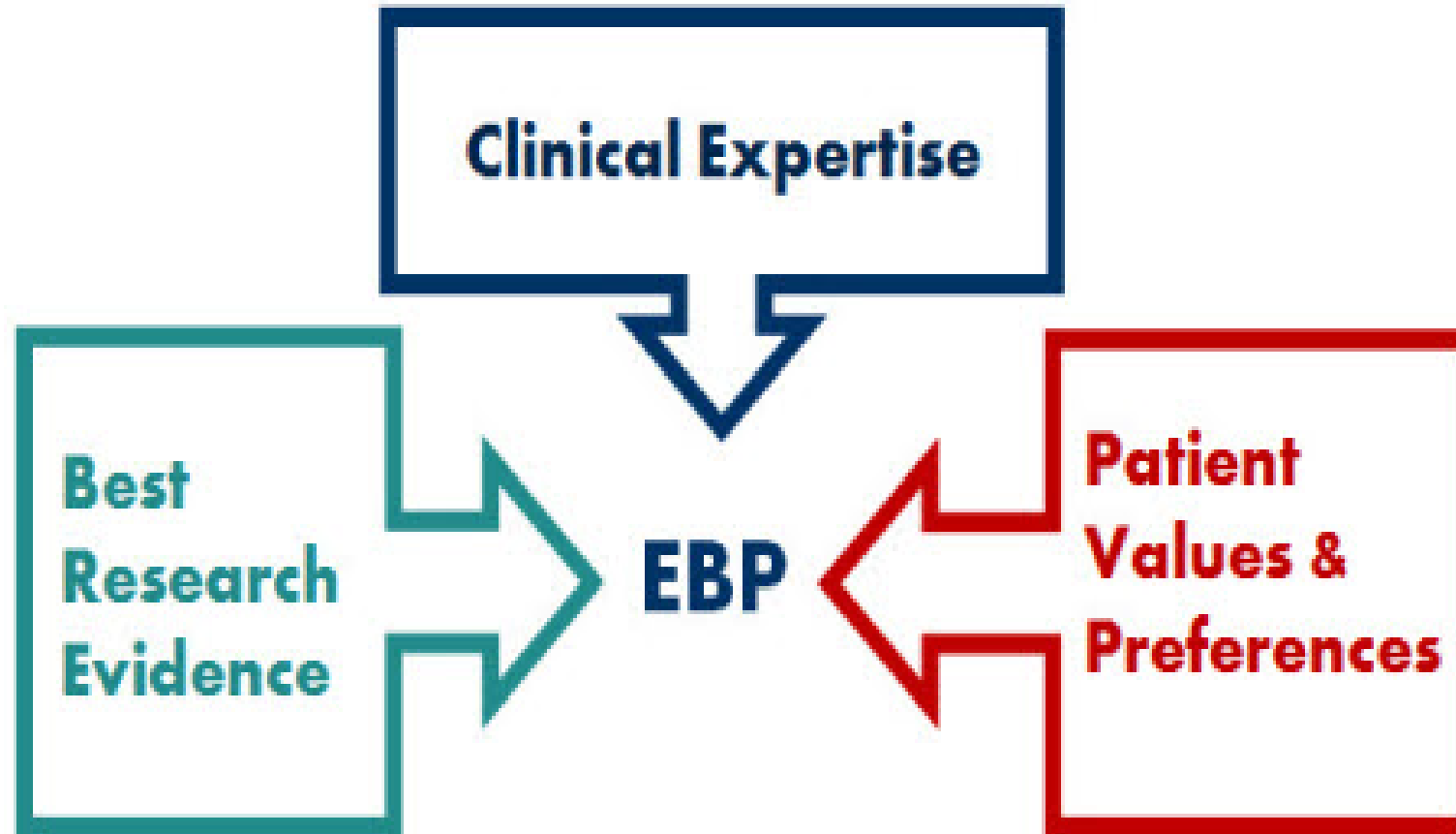
Relationship of impairment, functioning and compensation

- Sample of persons with ABI and documented memory impairment presenting for cognitive rehabilitation.
- Cognitive impairment not associated with frequency of baseline compensation strategy use.
- Lower frequency of compensatory strategy use was correlated with greater patient-reported activity limitations.
- Compensation use uniquely accounted for 16% of variance in predicting greater patient ratings of mood difficulties.
- Compensation strategy use is more strongly associated with measures of activity limitations than is cognitive impairment.

Yutsis, M., Bergquist, T., Micklewright, J., Gehl, C., Smigielski, J., & Brown, A. W. (2012). Pre-treatment compensation use is a stronger correlate of measures of activity limitations than cognitive impairment. *Brain Injury*, 26(11), 1297-1306.



Evidence-Based Practice



Cognitive Rehabilitation Practice Recommendations after TBI and Stroke

INCOG and ACRM

OPEN

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INCOG 2.0 Guidelines for Cognitive Rehabilitation Following Traumatic Brain Injury: What's Changed Since 2014 to Now?

Mark Theodore Bayley, MD, FRCP; Shannon Janzen, MSc; Amber Peter Bragge, PhD; Leanne Togher, PhD, BAppSc (Speech Path); A Eleni Patsakos, MSc; Lyn S. Turkstra, PhD, Reg-CASLP; Robert J. Mary Kennedy, PhD, CCC-SLP; Shawn Marshall, MD, MSc, FRCI; Jennie Ponsford, PhD, AO, MA (Clinical Neuropsychology)

Author Affiliations: *Neuro Rehabilitation Program, KITE Research Institute, Toronto Rehabilitation Institute-University Health Network, Temerty Faculty of Medicine, University of Toronto, Ontario, Canada (Dr Bayley and Mr Kua and Patsakos); Lawson Health Research Institute, Robsonwood Institute, London, Ontario, Canada (Mr Janzen and Harnett and Dr Teasell); Monash Sustainable Development Institute Evidence Review Service, Behavioural Works Australia (Dr Bragge), and Monash Epworth Rehabilitation Research Centre, Turner Institute for Brain and Mental Health, School of Psychological Sciences (Dr Ponsford); Monash University, Melbourne, Australia; Faculty of Health Sciences, The University of Sydney, Camperdown, New South Wales, Australia (Dr Togher); NHMRC Centre of Research Excellence in Aphasia Rehabilitation, La Trobe University, Bundoora, Victoria, Australia (Dr Togher); Speech-Language Pathology Program, School of Rehabilitation Science, McMaster University, Hamilton, Ontario, Canada (Dr Turkstra); Department of Physical Medicine and Rehabilitation, Schulich School of Medicine & Dentistry, University of Western Ontario, London, Ontario, Canada (Dr Teasell); Communication Sciences and Disorders, Chapman University, Irvine, California (Dr Kennedy); The Ottawa Hospital-Rehabilitation Center, University of Ottawa, Bruyère Research Institute, Ottawa, Ontario, Canada (Dr Marshall); and Epworth Healthcare, Melbourne, Australia (Dr Ponsford) (on behalf of the INCOG Expert Panel).*

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The opinions, results and conclusions reported are those of the authors. No endorsement by the Ontario Ministry of Health is intended or should be inferred.

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IT IS CRITICAL TO lines (CPGs) up to c latest evidence. Thereof the INCOG team presen *Cognitive Rehabilitation 1 (TR)*. In this brief introd of changes in the evidenc the current state and cha rehabilitation; and pro 2022.

WHY ARE RECOMM COGNITIVE REHAB TBI STILL A PRIORI

Prior to the publication the team prioritized o all other areas withi t for knowledge translati cognitive rehabilitation siderations. First, by its damage to the brain n attention, memory, exec aspects of communicati reviews highlight that cc

The authors declare no conflicts of

Corresponding Author: Mark T search Institute, Toronto Rehabilid 3rd Floor East Wing, Ste 3-102-1 2A2, Canada (mark.bayley@uho DOI: 10.1097/HTR.0000000000000837

1 Head Trauma Rehabil



Archives of Physical Medicine and Rehabilitation

Journal homepage: www.archives-pmr.org

Archives of Physical Medicine and Rehabilitation 2019;100:1515-33



SYSTEMATIC REVIEW

Evidence-Based Cognitive Rehabilitation: Systematic Review of the Literature From 2009 Through 2014



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From the "Cognitive Rehabilitation Department, John F. Kennedy Johnson Rehabilitation Institute, Hackensack Meridian Health System, Edison, New Jersey; "Department of Physical Medicine and Rehabilitation, Robert Wood Johnson Medical School, Rutgers University, New Brunswick, New Jersey; "Charlotte Center for Neuropsychological Services, Charlotte, North Carolina; "Traumatic Brain Injury Program, Park Terrace Care Center, Rego Park, New York; "Department of Psychiatry and Psychology, Mayo Clinic College of Medicine and Science, Rochester, Minnesota and Phoenix, Arizona; "Rusk Rehabilitation New York University Langone Health, New York City, New York; "New York University School of Medicine, New York City, New York; "Department of Physical Medicine and Rehabilitation, Indiana University School of Medicine, Indianapolis, Indiana; "Beechwood NeuroRehab, Langhorne, Pennsylvania; "Department of Rehabilitation Neuropsychology, Rehabilitation Hospital of Indiana, Indianapolis, Indiana; "A. Philadelphia College of Osteopathic Medicine, Philadelphia, Pennsylvania; "Department of Communication Sciences and Disorders, Western Washington University, Bellingham, Washington; "Department of Psychiatry, Boston University School of Medicine, Boston, Massachusetts; "Veterans Affairs Boston Healthcare System, Jamaica Plain Division, Boston, Massachusetts; and "Advocate Christ Medical Center, Oak Lawn, Illinois, the United States.

Abstract

Objectives: To conduct an updated, systematic review of the clinical literature, classify studies based on the strength of research design, and derive consensus, evidence-based clinical recommendations for cognitive rehabilitation of people with traumatic brain injury (TBI) or stroke.

Data Sources: Online PubMed and print journal searches identified citations for 250 articles published from 2009 through 2014.

Study Selection: Selected for inclusion were 186 articles after initial screening. Fifty articles were initially excluded (24 focusing on patients without neurologic diagnoses, pediatric patients, or other patients with neurologic diagnoses, 10 noncognitive interventions, 13 descriptive protocols or studies, 3 nontreatment studies). Fifteen articles were excluded after complete review (1 other neurologic diagnosis, 2 nontreatment studies, 1 qualitative study, 4 descriptive articles, 7 secondary analyses). 121 studies were fully reviewed.

Data Extraction: Articles were reviewed by the Cognitive Rehabilitation Task Force (CRTF) members according to specific criteria for study design and quality, and classified as providing class I, class II, or class III evidence. Articles were assigned to 1 of 6 possible categories (based on interventions for attention, vision and neglect, language and communication skills, memory, executive function, or comprehensive-integrated interventions).

Data Synthesis: Of 121 studies, 41 were rated as class I, 3 as class Ia, 14 as class II, and 63 as class III. Recommendations were derived by CRTF consensus from the relative strengths of the evidence, based on the decision rules applied in prior reviews.

Conclusions: CRTF has now evaluated 499 articles (109 class I or Ia, 68 class II, and 314 class III) and makes 29 recommendations for evidence-based practice of cognitive rehabilitation (9 Practice Standards, 9 Practice Guidelines, 11 Practice Options). Evidence supports Practice Standards for (1) attention deficits after TBI or stroke; (2) visual scanning for neglect after right-hemisphere stroke; (3) compensatory strategies for mild memory deficits; (4) language deficits after left-hemisphere stroke; (5) social-communication deficits after TBI; (6) metacognitive strategy training for deficits in executive functioning; and (7) comprehensive-holistic neuropsychological rehabilitation to reduce cognitive and functional disability after TBI or stroke.

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DOI: 10.1097/HTR.0000000000000837

0003-9993/19/36 - see front matter © 2019 by the American Congress of Rehabilitation Medicine
<https://doi.org/10.1016/j.apmr.2019.02.011>

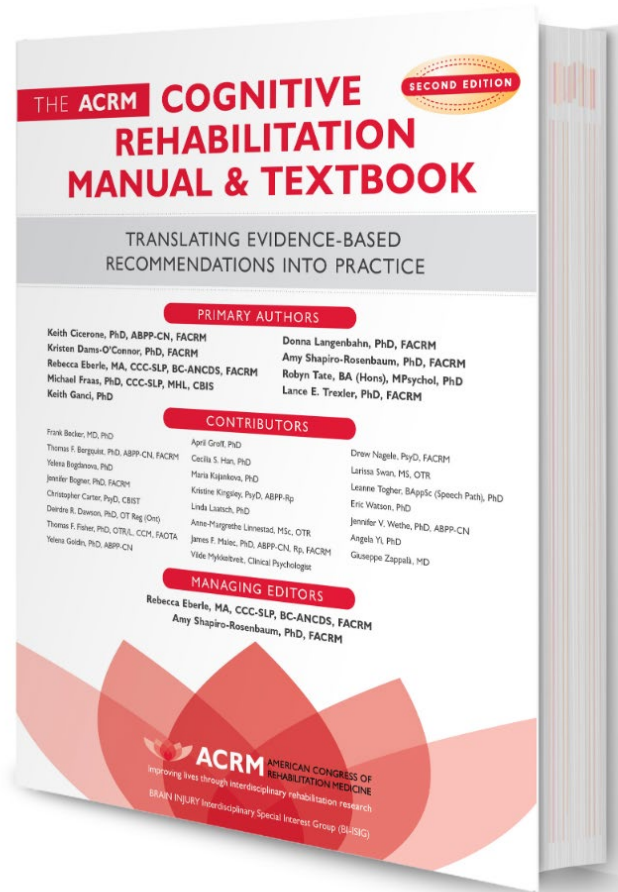
- Translated into Practice Standards, Practice Guidelines and Practice Options for treatment of:

- Attention Deficits
- Visuoperceptual Deficits
- Memory Deficits
- Communication and Social Cognition
- Executive Function Deficits



- Cicerone, K. D., Goldin, Y., Ganci, K., Rosenbaum, A., Wethe, J. V., Langenbahn, D. M., Malec, J. F., Bergquist, T. F., Kingsley, K., Nagele, D., Trexler, L., Fraas, M., Bogdanova, Y., & Harley, J. P. (2019). Evidence-Based Cognitive Rehabilitation: Systematic Review of the Literature From 2009 Through 2014. *Archives of physical medicine and rehabilitation*, 100(8), 1515–1533. <https://doi.org/10.1016/j.apmr.2019.02.011>
- Velikonja, D., Ponsford, J., Janzen, S., Harnett, A., Patsakos, E., Kennedy, M., Togher, L., Teasell, R., McIntyre, A., Welch-West, P., Kua, A., & Bayley, M. T. (2023). INCOG 2.0 Guidelines for Cognitive Rehabilitation Following Traumatic Brain Injury, Part V: Memory. *The Journal of head trauma rehabilitation*, 38(1), 83–102. <https://doi.org/10.1097/HTR.0000000000000837>

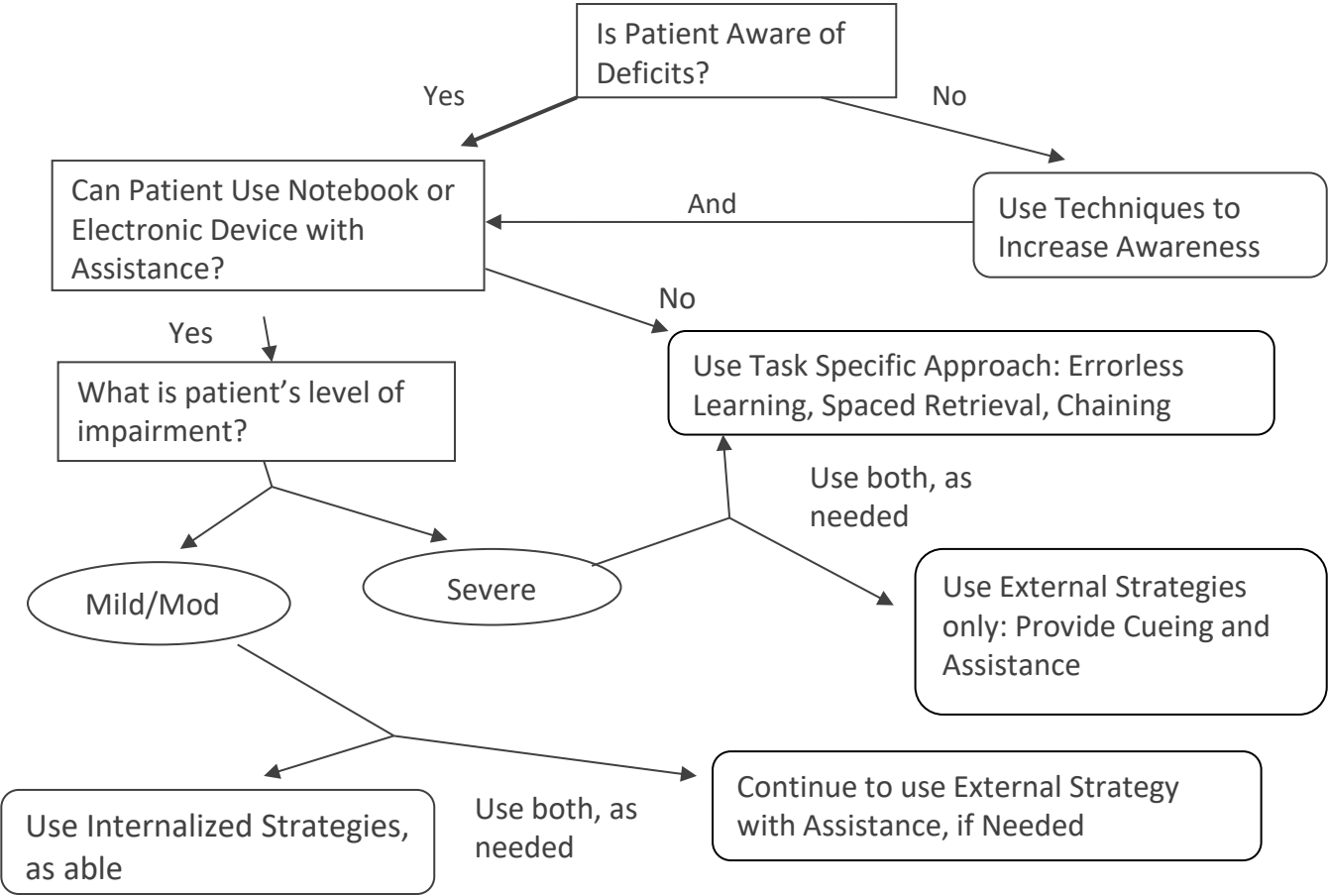
Translating Evidence into Clinical Practice



Eberle, R., & Rosenbaum, A. (Eds.). (2022). *Cognitive rehabilitation manual and textbook: Translating evidence-based recommendations into practice* (2nd ed.). ACRM Publishing.



Decision Tree to Guide Treatment Planning



Level of Awareness

- **No Awareness**
- **Intellectual Awareness** – Understand at some level that function is impaired.
- **Emergent Awareness** – Understand problems when it is happening.
- **Anticipatory Awareness** – Recognize that a problem will occur as the result of an impairment.

Level of compensation

- **External Compensation** – compensation initiated by person outside of the individual with brain injury.
- **Situational Compensation** – Strategies triggered by a specific circumstance in which a deficit is likely to affect performance.
- **Recognition Compensation** – strategies triggered by recognition that problem is occurring.
- **Anticipatory Compensation** – implement strategies by being able to anticipate when a problem will occur.

Connecting Awareness and Compensation

Level of Awareness	Types of compensation available
No Meaningful Awareness	• External compensation
Intellectual Awareness	• External Compensation • Situational Compensation
Emergent Awareness	• External Compensation • Situational Compensation • Recognition Compensation
Anticipatory awareness	• External Compensation • Situational Compensation • Recognition Compensation • Anticipatory Compensation

Crosson, B., Barco, P. P., Velozo, C. A., Bolesta, M. M., Cooper, P. V., Werts, D., & Brobeck, T. C. (1989). Awareness and compensation in postacute head injury rehabilitation. *The Journal of head trauma rehabilitation*, 4(3), 46-54.

Approaches to Rehabilitation Memory

APPROACHES	TECHNIQUES	
EXTERNAL COMPENSATION	Orientation notebook	Errorless learning, spaced retrieval, chaining
	Electronic device	Cell phone, pager, alarms
	Memory notebook	
MEMORY STRATEGY TRAINING	Association Techniques	Visual-verbal association, visual-verbal schematics, visual peg method, Method of Loci
	Organizational & Elaboration Techniques	First letter mnemonics, semantic clustering, PQRSST, use of humor, storytelling

General Guidelines for External Memory Strategies

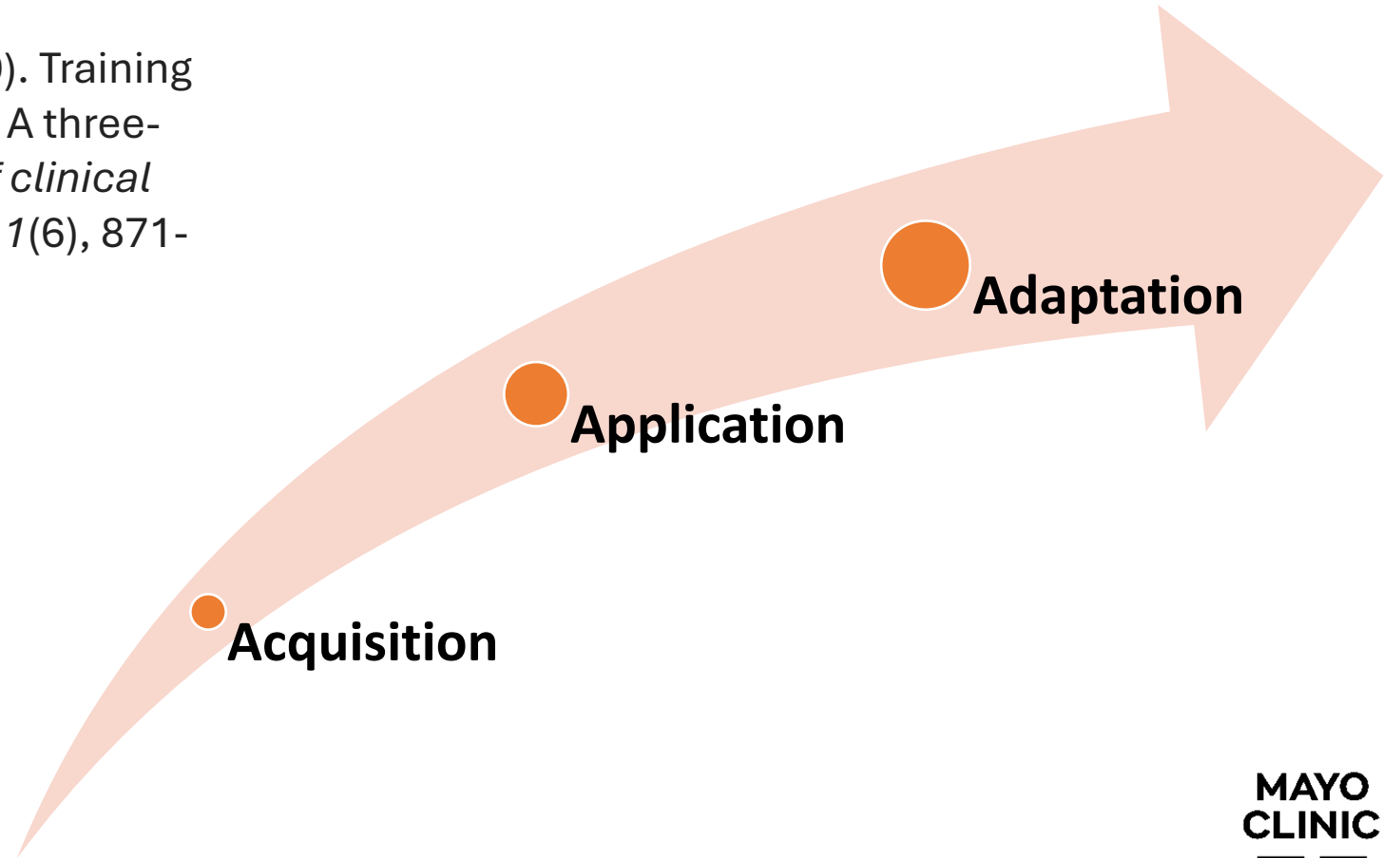
- Constant and easy access to the external device or notebook.
- Training of all staff and family members in the use of device.
- Errorless learning techniques and use of procedural memory for **severely** impaired patients.
- Multiple learning & generalization trials.
- **Address any executive dysfunction including impairments in awareness.**
- Apply external devices to functional tasks in the daily life of the patient.
- Use **cues** early in treatment and fade over time
 - Mild impairment: Rapid fading
 - Severe impairment: Gradual fading

Cue Types

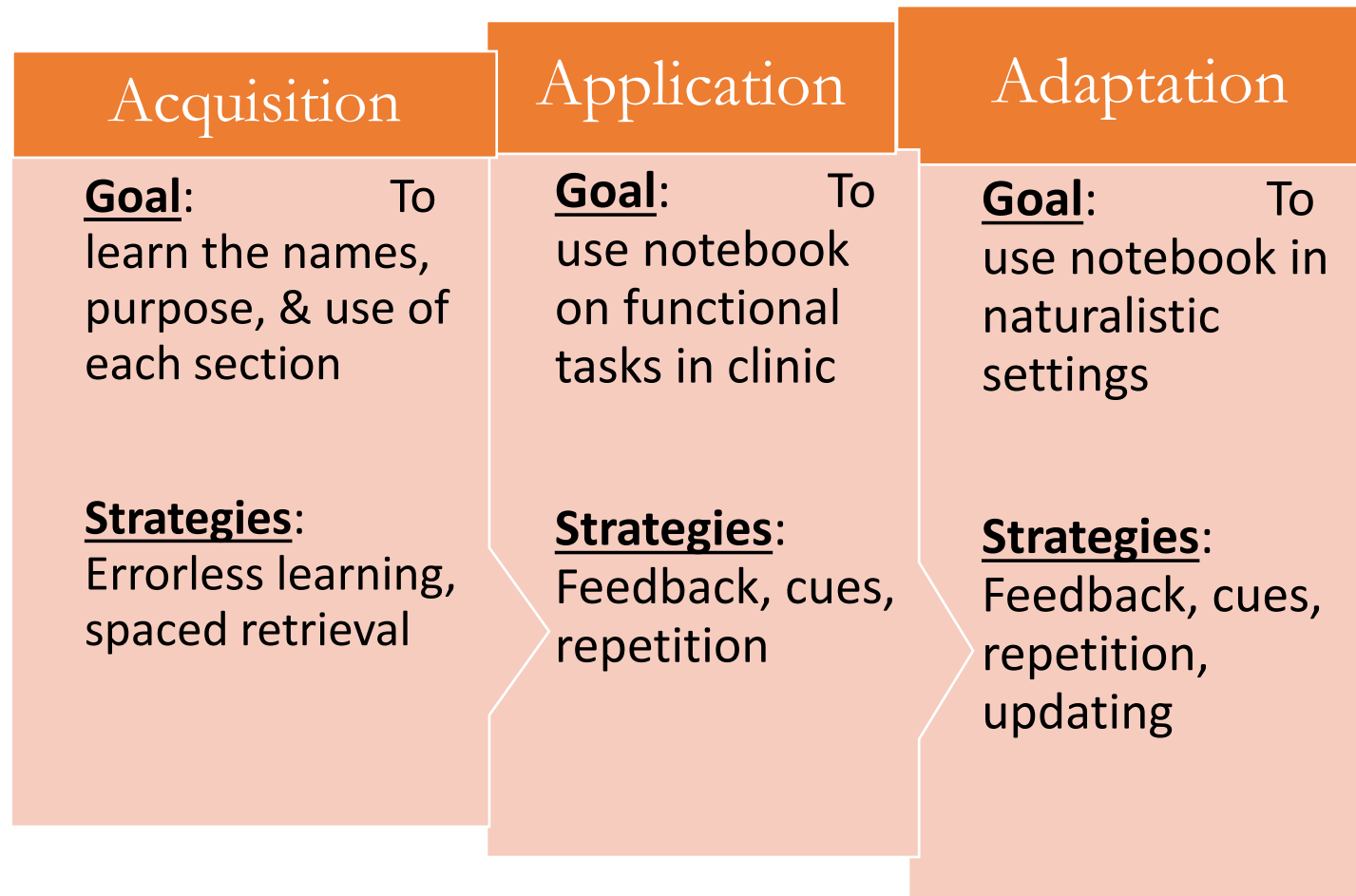
- **Direct cue:** specific prompt given by someone other than the person with injury
- **Indirect cue:** general prompt given by someone else
- **Self-cue:** consciously cueing oneself; think about where info would be found
- **Independent routine:** person with injury automatically referring to calendar for info

Stages of Strategy Training

Sohlberg, M. M., & Mateer, C. A. (1989). Training use of compensatory memory books: A three-stage behavioral approach. *Journal of clinical and experimental neuropsychology*, 11(6), 871-891.



Stages in Memory Notebook Training



(Sohlberg & Mateer, 2001)

Acquisition Stage

Severity of memory impairment determines which strategies are utilized.



- Errorless Learning
- Spaced Retrieval

- Question & Answer
- Rehearsal
- Knowledge Questions

Acquisition Stage

Question & Answer Rehearsal Samples

- In what section of your Memory Notebook do you plan evening activities?
- In what section of your Memory Notebook do you record future appointments?

Knowledge Questions

- You should review what you have recorded in the book when _____ .
- You should write in the Memory Notebook when _____ .

Application Stage

- Memory notebook is integrated into various structured activities, with the clinician.
- Tasks are chosen for functionality and relevance for each person
- Cuing is provided for client learning and success



Adaptation Stage

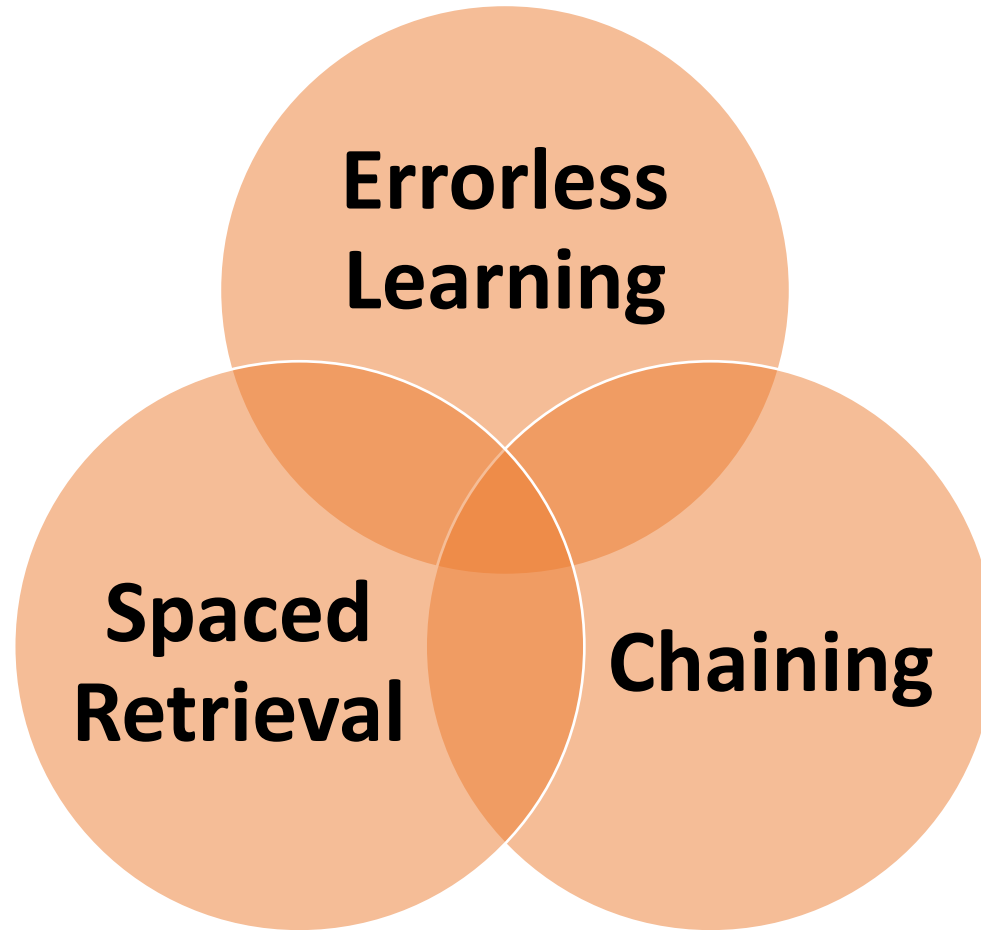
- Applies skills learned to tasks and responsibilities in naturalistic settings – outside the clinic
- External device is functionally integrated into daily routines to:
 - Document information, activities
 - Support prospective memory
 - Organize tasks



Strategies for **Severe Memory Impairment**: Overview

- Appropriate for clinically important functional skills training, e.g., safe transfers
- Domain specific learning; limited generalization
- Attempts to maximize functioning through recruitment of procedural memory

Effective Strategies for Severe Impairment



Errorless Learning

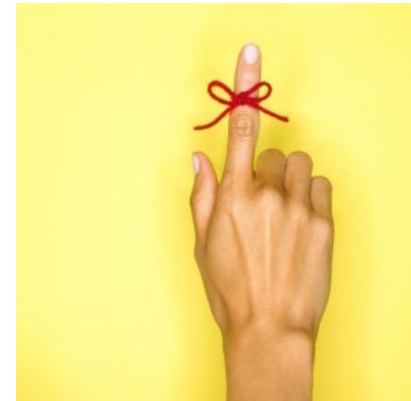
- **Presents information in a way that minimizes the possibility of making mistakes.**
- **Therapist presents simple information and requests the patient to immediately repeat.**
- **More effective when combined with spaced retrieval or with chaining techniques.**

Errorless Learning Training Samples

- a. **“The names of the notebook’s sections are the schedule, the memory log, and.... What are the names of the sections of your notebook?”**
- b. **“The schedule section of your notebook is for you to record your appointments for the day. What do you record in the schedule section?”**
- c. **The things to do section of your memory notebook is for you to record things you need or want to do that day. What do you record in the things to do section?”**

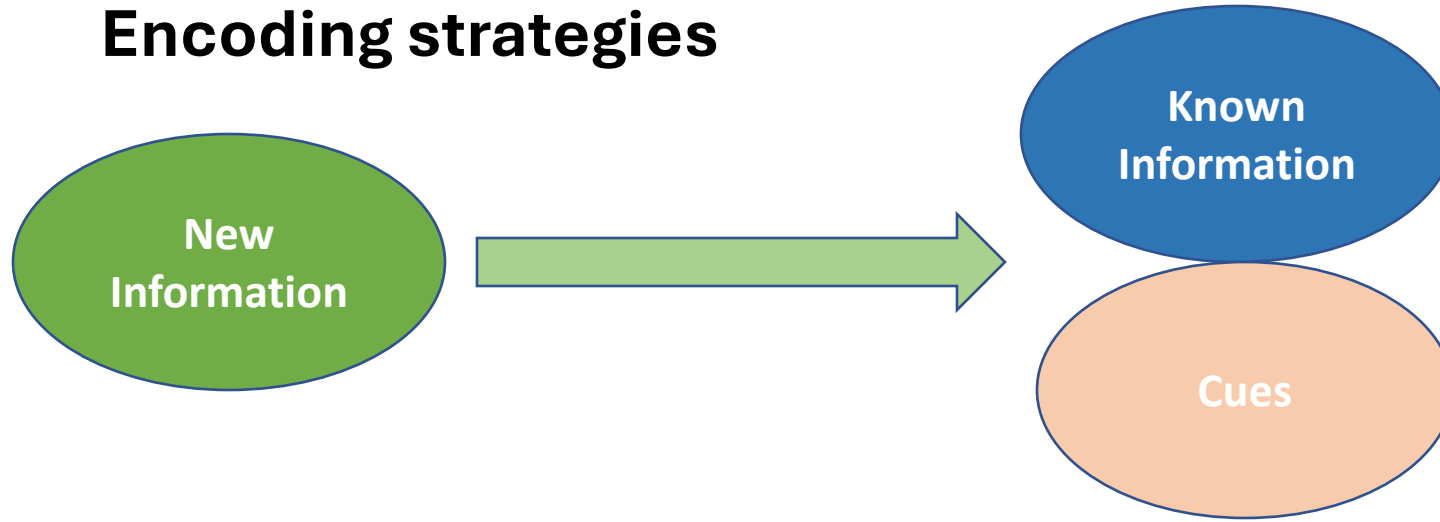
Memory Strategy Training

- Internal, self-instructional strategies for storage and retrieval of declarative information.
 - Verbal or non-verbal
 - Can be facilitated by external strategists
- Most effective for those with mild to moderate memory impairments



Memory Strategy Training

Encoding strategies



Retrieval strategies

Enhance patient's ability to find and retrieve information at the time of recall

Types of Metacognitive Techniques



Association Techniques

Technique	Description
Visual Peg Method	Target items are linked with a standard set of peg words which are already learned in a set sequence.
Method of Loci	Linking information to specific (external) visual reference
Visual Imagery	Linking information to specific (internal) visual reference
Absurdity	Humor and high levels of interaction make associations stronger

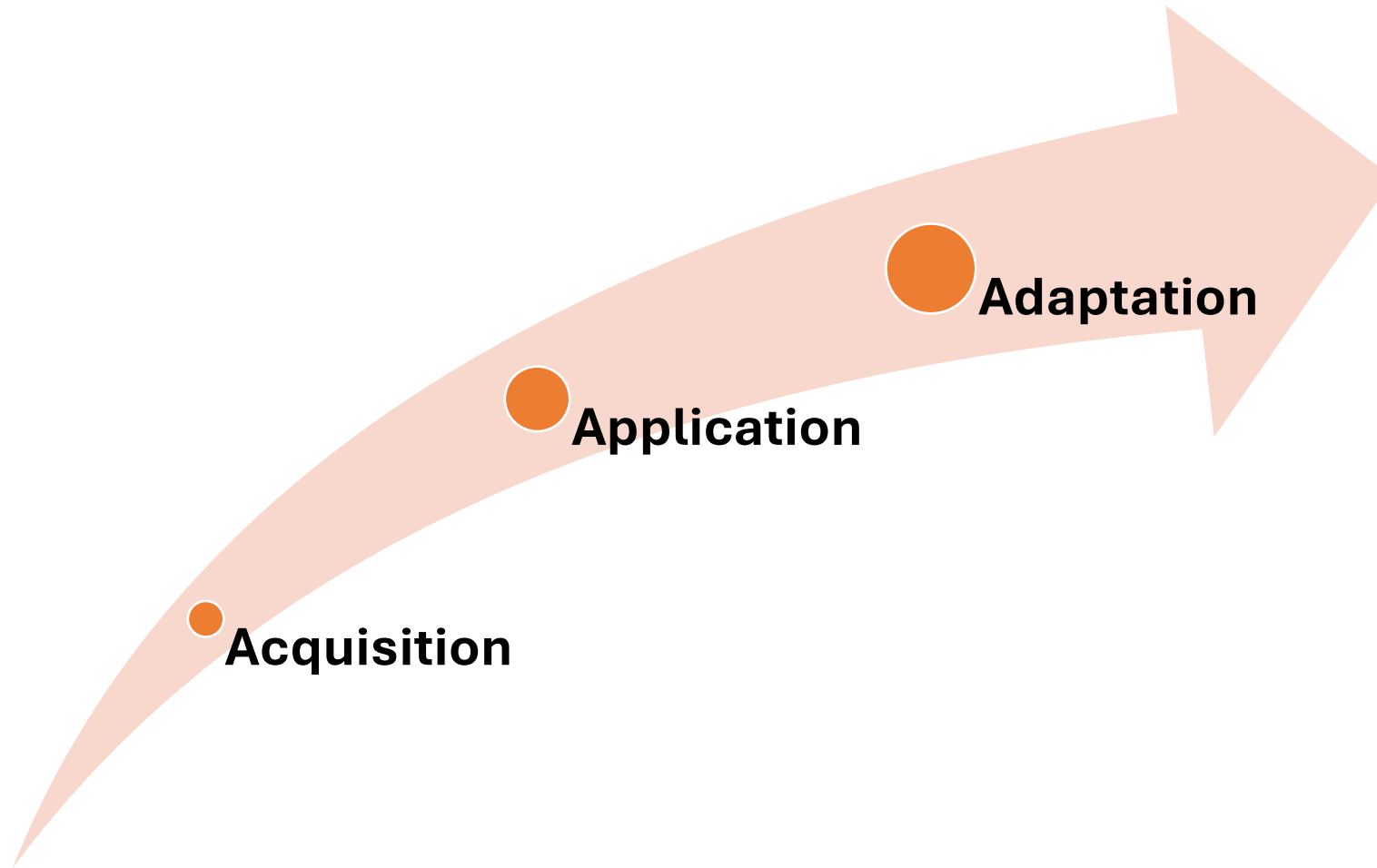


Thomas F. Bergquist
Class of 1983
Student Number: 122

Organizational Techniques

Technique	Description
First Letter Mnemonics	Use the first letter of each of a series of words to form a single word or pseudo-word. Example: HOMES = Huron Ontario Michigan Erie Superior
Semantic Clustering	Grouping items in a list into smaller categories
PQRST	Self-instructional technique to learn and recall complex written information P review Q uestion R ead S tate T est

Stages of Strategy Training



Acquisition Stage

Step 1: Introduction to technique

- **Psycho-education**
 - **Establish how the strategy will improve their overall effectiveness and independence.**
 - **Use examples of real-life use**

Step 2: Learn the strategy

- **Guide patient systematically through use of strategy**
- **Desired outcome for patients to be able to:**
 - **Describe the methods**
 - **Identify tasks and situation for use**
 - **Be able to recite the steps involved in applying the strategy**

Application Stage

- **Practice** in simple 'real-life' or role-play scenarios
- **External support** begins with high levels and fades with success.
- **Recall periods** should gradually increase (24, 48, 72 hours, one week).
- **Levels of complexity/amount** should gradually increase.
- **Self generation** of techniques.
- **Feedback and discussion** from both therapist and patient on performance.

Adaptation Stage

- **Apply techniques** to more complex, functional and everyday tasks, outside the clinic.
- **Generalize** into ecologically valid environments and tasks.
- **Incorporate family** and significant others to facilitate and reinforce generalization.



Summary of Metacognitive Strategies

- **Only for those with mild or mild-moderate level of impairment.**
- **Client must self-initiate strategy use in real-life environments.**
- **Some strategies may be difficult to generalize in real environments due to slow processing speed or time pressures.**
- **Often used in combination with external strategies.**

The importance of integrating cognitive and emotional interventions.

- Twenty years after the advancement of cognitive rehabilitation, there is still a tendency to view and treat cognitive functioning, personality, and emotional reactions as separate entities.
- Critical gap remains in explaining how we can bridge the various needs of our clients in more integrated treatments that not only acknowledge but **mesh** cognitive, emotional, and motivational interventions.



Mateer, C. A., Sira, C. S., & O'Connell, M. E. (2005). Putting Humpty Dumpty together again: the importance of integrating cognitive and emotional interventions. *The Journal of head trauma rehabilitation*, 20(1), 62-75.



Thomas F. Bergquist

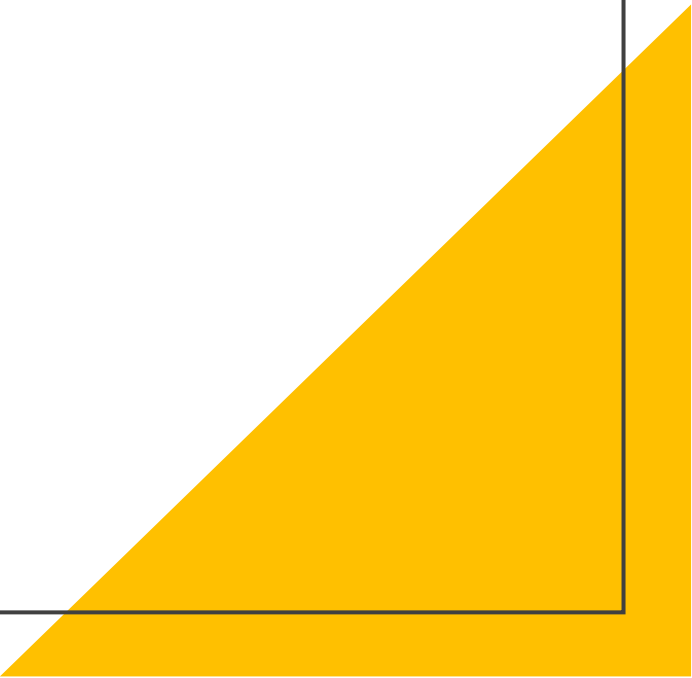
Class of 1983

Student Number: ???

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- Wilson, B. A. (2009). *Memory rehabilitation: Integrating theory and practice*. Guilford Press.

Questions and Discussion





Improving Access to Care for Persons with TBI

Adapting Behavioral Health Therapies for People with Cognitive Disabilities

Presenting Author:

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Head, Division of Rehabilitation Psychology and Neuropsychology
Associate Member, Harborview Injury Prevention & Research Center



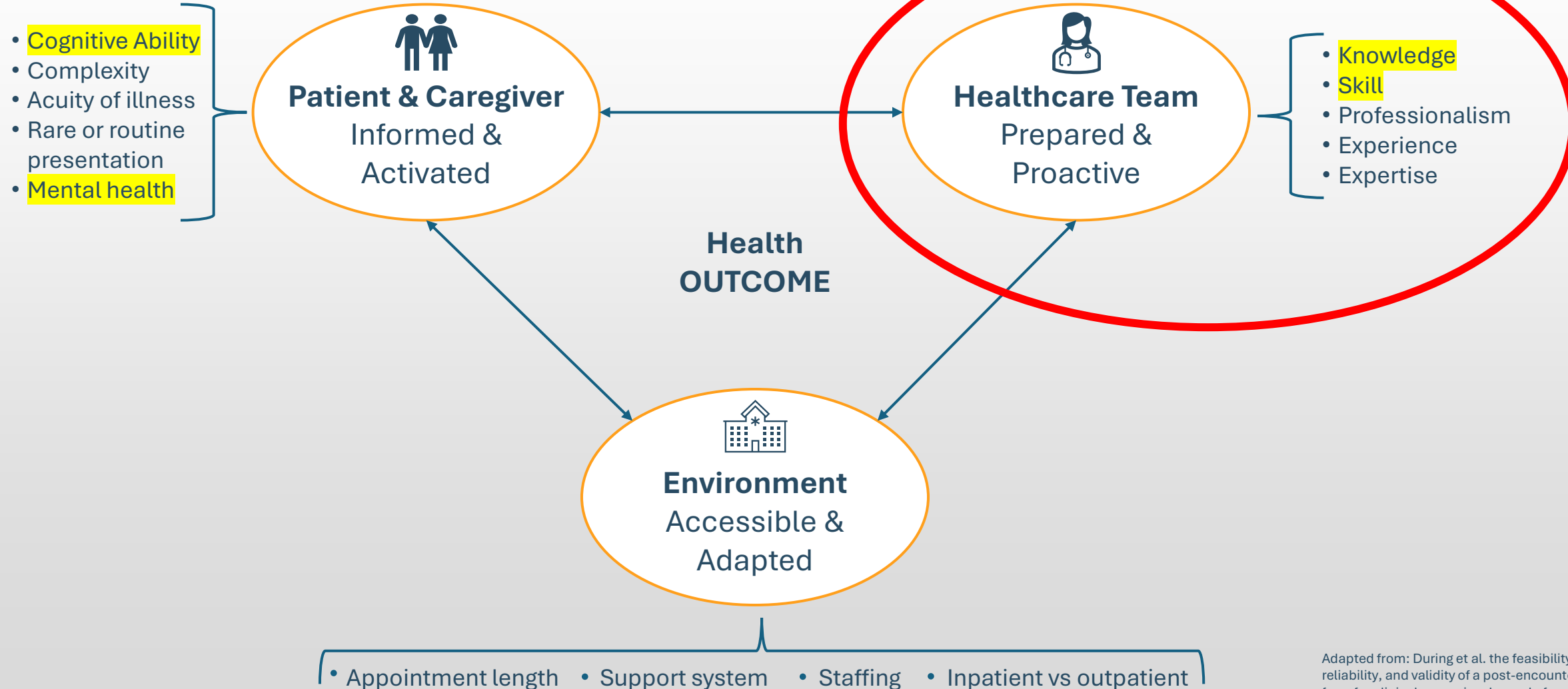
Full team

Jeanne M. Hoffman^{1,2}, Aaron M. Martin^{3,4}, Daniel Goldschmidt²,
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Active Engagement in Healthcare



Overview

- Best practices and strategies for adapting psychological and behavioral therapies to accommodate individuals with cognitive impairments
 - Key adaptations and methods for behavioral health interventions
 - Practical tools clinicians can use to improve therapy outcomes for individuals with brain injuries and increase provider self-efficacy



Background



- Cognitive impairment has been found to be the number one rehabilitation need in the chronic phase after TBI ^{1,2}
 - Associated with lower satisfaction with life
- Cognitive impairment is a barrier to referral and receipt of evidence-based behavioral treatments (EBTs) ³

Challenges to Delivering Care to Persons with Cognitive Impairments



“It is challenging to get comorbidities treated by providers who understand cognitive disability that come along with brain injury...finding a therapist who can take into consideration the cognitive limitations is hard to find.”

...cognitive deficits of patients with TBI were noted to be the leading barrier to ensuring adequate treatment...¹

1. Nakase-Richardson R, Cotner BA, Martin AM, Agtarap SD, Tweed A, Esterov D, O'Connor DR, Ching D, Haun JN, Hanks RA, Bergquist TF. Provider perspectives of facilitators and barriers to reaching and utilizing chronic pain healthcare for persons with traumatic brain injury: a qualitative NIDILRR and VA TBI Model Systems Collaborative Project. The Journal of Head Trauma Rehabilitation. 2024 Jan 1;39(1):E15-28.

Psychological health conditions are common following TBI

- High rates of
 - Sleep difficulties ^{4,5}
 - Chronic pain ⁶
 - Post-traumatic stress disorder (PTSD) ⁷
 - Depression ⁸
- These conditions can also further impair cognition
- All are associated with worse recovery after TBI and all can exacerbate each other. ^{9,10}



Adaptations of EBTs for cognitive impairment have been successful

- Cognitive behavioral treatment for chronic pain¹¹
- Motivational interviewing to promote continuous positive airway pressure (CPAP) use¹²
- Cognitive Processing Therapy for PTSD¹³
- Cognitive behavioral therapy for depression¹⁴



Adaptations that have been made include:

- Use of concrete examples
- Visual aids
- Involving a caregiver
- Abbreviated sessions
- Integration of memory aids

Goal of our I-HEAL Project

Develop a Provider Toolkit for Accommodating Cognitively Impaired Persons in Evidence- Based Treatments

- Goal is to address barriers that limit the ability of a person with cognitive impairment to engage in therapies that have been shown to improve mental health conditions and promote well-being
- Evidence-based therapies (EBTs) exist for the most common conditions that co-occur in TBI:
 - **Post-Traumatic Stress Disorder (PTSD)**
 - **Depression**
 - **Sleep Disorders**
 - **Chronic Pain**



The Approach:

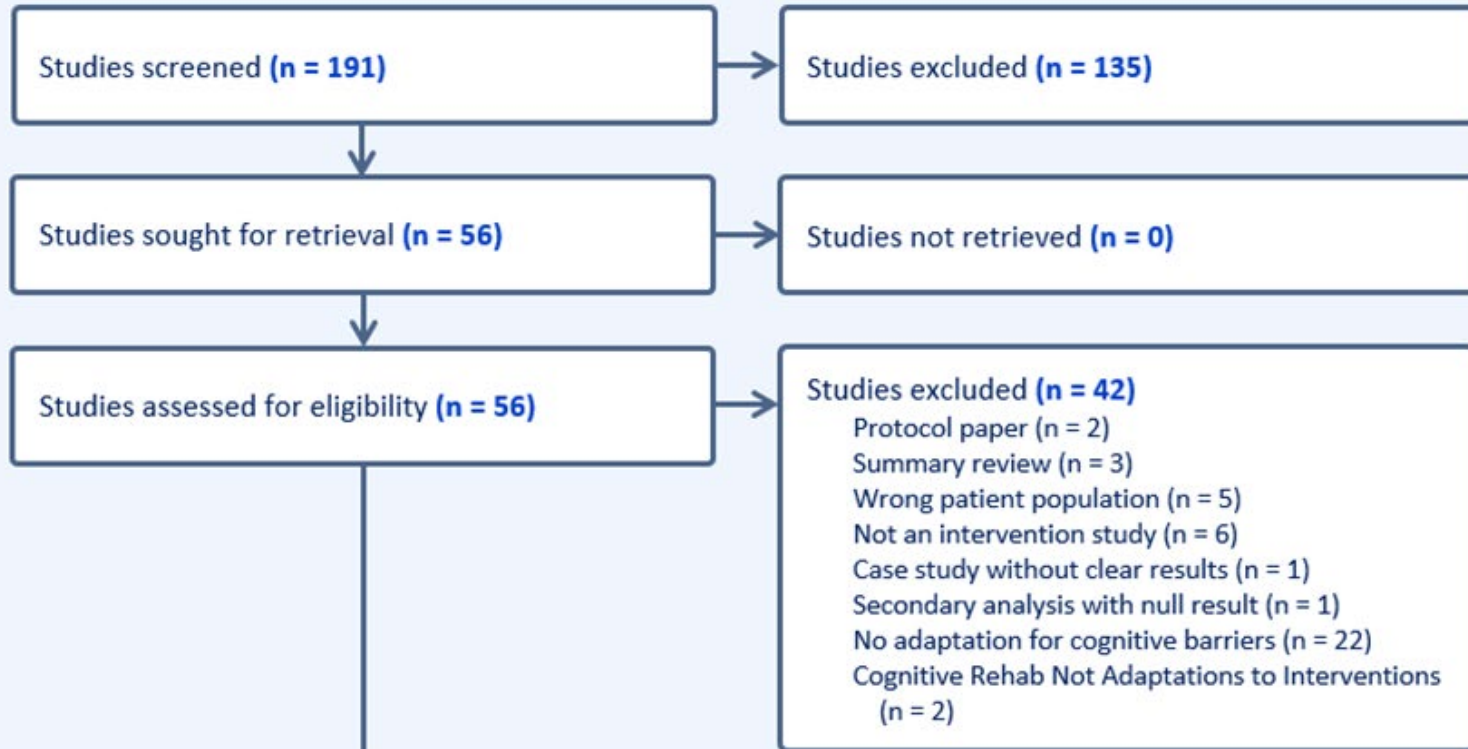
First – Conduct an environmental scan:

- Literature Search
- Subject-Matter Experts (within the group and our Professional Partners) to identify materials and/or names/connections to others that may have access to
 - general information on strategies to manage cognitive impairment for behavioral health providers
 - Specific treatment manuals that integrate adaptations and/or psychoeducation on cognitive impairments into existing evidence-based therapies (EBTs)
- Initial requests to connectors



Literature review

Identification & Screening



Included

Studies with products included in review (n = 14)



Connectors

Email template developed

- **19:** investigators, researchers and allied professionals in the field were initially contacted
- **14:** additional contacts via Community Engagement Council's professional partners, other professional networks and seminars, authors cited from the literature collected



Second – Determining what products go in the toolkit

- What was in-scope vs. out-of-scope
 - Sleep, Chronic Pain, PTSD, Depression vs. Diabetes prevention program, Aggression management, Substance Abuse
- Determined the criteria for inclusion
 - Goal for toolkit to be “living” so new products can be reviewed/included, such as current “out-of-scope” products
- Gathered all the products and had subject matter experts review and rate each



Criteria and Grid Development

Criteria	Description	Rating
Complexity	Does the level of complexity make this content easier or harder to implement?	1 = Easy 2 = Moderate 3 = Hard
Accuracy	Content is current and accurate	1 = Yes 2 = No
Acceptability/Relevance	The information is relevant to/suitable for the intended users	1 = Mostly Relevant 2 = Sections are Relevant 3 = Not Relevant
Usability	The information is well organized and easy to navigate	1 = Well organized/easy to use 2 = Moderately organized/somewhat
Credibility/Evidence based	The authority/trustworthiness of the information is apparent, references are available, and authors have contact information. Feasibility and potential	1 = Yes 2 = No





Current Products:

- 24 total products* with adaptations for those with cognitive impairment
 - 10 with general recommendations**
 - 4 with multidomain recommendations**
 - 10 with adaptations in the four areas**
 - 4 on Sleep disturbance
 - 3 on Chronic Pain
 - 2 on Depression
 - 1 on PTSD

This list is available to you!

*Some contain multiple pieces (e.g., therapist and patient manual, multiple information sheets)

Adaptation Examples (General or Integrated)

- Provide extra time and only one idea at a time
- Take breaks or plan for when they are at their best
- Provide written information and reminders
- Repeat information
- Keep it simple and clear
- Reduce distractions
- Connect to what is important to the person

Next steps

Create a Toolkit

1. *Select high-quality materials from the product grid to be included in the toolkit*
2. *Identify relevant providers (e.g., psychologists, social workers, counselors) who might benefit and work with them to brainstorm toolkit content, layout, and functions*

Implement the Toolkit

1. *Determine key strategies for dissemination to practitioners, educational institutions, healthcare systems, and other identified groups to increase the utilization of recommendations*



Getting input via Mentimeter

- Menti.com – use code 9680 6661
- Or



Input needed on how to implement



- **Question for you:**
- Are you familiar with interventions that have been modified for people with cognitive impairments? If yes, do you use them in your practice?
- response option: Not at all, rarely, sometimes, usually, all of the time

Need your input on next steps:

- **Question for you:**
- Do you include specific modified interventions in your recommendations of your assessment?
- Response option: Never, rarely, sometimes, usually, always.



Need your input on next steps:

- **Question for you:**
- How often do you get asked about modifying interventions for individuals with cognitive impairment?
- Response option: Never, rarely, sometimes, regularly, frequently.



Input needed on how to implement

- **Question for you:**
- Clinicians make modifications in their approach to engaging with individuals with cognitive impairment based on your recommendations.
- Response option: Not at all, rarely, sometimes, regularly, all of the time



Need your input on training:

- **Question for you:**
- How do they train new providers to identify and adapt assessment/treatment protocols for individuals with cognitive impairment?
- Choose all that apply – standard part of curriculum/course where it is taught, didactics, clinical exposure/training, opportunity to learn at conferences/specialty courses, other – open ended



More input on training

- **Question for you:**
- To what extent is additional training needed within psychology to aid future clinicians in adapting their treatments to meet the needs of those with cognitive impairment?
- Response option: maybe a 0 to 10 with anchors of nothing else needed, to need something developed — followed by open ended: What would you recommend?



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Questions?

Thank you for your attention! Check out the I-HEAL website for more information:

