

The Evidence Basis and Guidelines for Cognitive Rehabilitation in Brain Injury

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- Director of Neuro Rehabilitation for Hope Network Neuro Rehabilitation
- Has been treating individuals with brain injury and spinal cord injury for over 30 years
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- Board-certified Rehabilitation Psychologist, as well as a Certified Brain Injury Specialist Trainer



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Disclosures

- Dr. Waalkes has no conflicts of interest to disclose
- Dr. Waalkes is a full-time employee of Hope Network Neuro Rehabilitation
- Dr. Waalkes is the Owner of Thomapple Psychological Services, PLLC, a psychology consulting service

- Allison Mezo has no conflicts of interest to disclose.
- Allison Mezo is an employee of Hope Network Neuro Rehabilitation and Western Michigan University



Program Description

- This presentation reviews recent research regarding the importance and effectiveness of cognitive rehabilitation.
- It details the latest guidelines for effective implementation of cognitive rehabilitation.



Objectives

1. Participants will be able to **identify the evidence basis** for cognitive rehabilitation in brain injury
2. Participants will be able to **identify the best practice** of cognitive rehabilitation in brain injury
3. Participants will be able to **discuss effective approaches to treatment planning** for cognitive rehabilitation in brain injury



What is Cognitive Rehabilitation?

Learning or re-learning cognitive skills allowing for compensation for injury

Methods include:

- Developing new skills
- Reinforcing existing skills
- Strengthening damaged skills
- Re-establishing previously learned skills



Cognitive Rehabilitation is a Central Feature of Many Post-Acute Transitional Rehabilitation Programs

What is it?

- Cognitive rehabilitation is a systematically applied set of medical and therapeutic services designed to improve cognitive functioning and participation in activities that may be affected by difficulties in one or more cognitive domains. (*Brain Injury Association of America (BIAA), 2019*)



Cognitive Rehabilitation

- Cognitive rehabilitation is a service that is **functional** and **systematic**. It is based on understanding and assessment of an individual's injury



- It is an umbrella term for many techniques that **target cognitive impairments and improve independence**, while:
 - **Strengthening** behavioral patterns
 - **Creating** new behavior patterns
 - **Compensating** for what has been lost



Cognitive Therapy and Brain Injury

Cognitive therapy is what often sets brain injury rehabilitation apart from physical rehabilitation.

Cognitive problems change over time for individuals with brain injury and may evolve at a different pace for each person, with many interacting factors affecting initial recovery, and recovery over time.

Cognitive disorders make it difficult for some individuals with brain injury to monitor changes in their daily health or to reliably comply with medical treatment regimens. (*Brain Injury Association of America (BIAA), 2019*)



Post-Acute Transitional Rehabilitation and Cognitive Rehabilitation

- Because of the central nature of cognitive impairment to neurological injury, effective rehabilitation **MUST** include cognitive goals
- Even the cognitive demands of independence for a person with multi-trauma injuries argue for inclusion of cognitive elements in treatment planning.
- Post-Acute Rehabilitation derives its effectiveness, in large part, to this cognitive focus.
 - Enhances engagement
 - Supports application
 - Facilitates transfer of gains from one context to another
 - Supports problem solving
 - Increases self-monitoring and safety



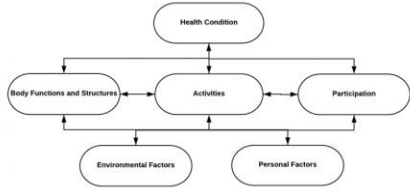
Keeping a *Functional Focus* Supporting Participation Goals

“Cognitive rehabilitation should always be directed toward improving everyday functioning, and should include active attempts to promote generalization or directly apply compensatory strategies to functional contexts” (Ciccerone et al., 2019)

Interventions often target **impairments**, but it is the **function** that matters



WHO ICF: Impairment, Disability, & Handicap



Cognitive Rehabilitation is Transdisciplinary Intervention

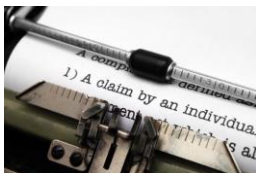
Transdisciplinary vs. Multidisciplinary

- Not just something that happens in speech sessions
- Source materials come from a variety of professional organizations and most are from ACRM/Archives of PM&R, the home for interdisciplinary rehabilitation professional collaboration



If They Are So Successful, Why is Cognitive Rehabilitation Not Commonplace?

The curse of the "excluded benefit"



Cognitive Needs Are a Recognized Criteria For Inpatient Rehabilitation

- InterQual® (2019) standards are used by healthcare organizations to develop recommendations for the most appropriate level of care.
- These standards recognize the importance of cognitive impairment as a qualifying factor for patients considered for neurologic sub-acute and skilled nursing levels of care, even with minimum to moderate levels of physical needs. (How much this is emphasized in practice is another matter...)
- These standards detail the cognitive or physical inability to manage care and the lack of an available caregiver as qualifying criteria for SAC-SNF admission.



Interqual® Cognitive Qualifying Criteria

InterQual®

Hope Network Neuro Rehabilitation

Medical Review Acute Neurologic (SAC-SNF)

PREADMISSION CLEAR ALL EXPAND ALL

Preadmission, One:

- Skilled Nursing Facility, AK
- Treatment precluded in a lower level of care
 - Clinical complexity or other
 - Cognitive or physical
 - Home environment not conducive to care, & One
 - Services unavailable through home care or outpatient
 - Extended skilled care services required, & One

NOTES

International Note
Patient and/or caregiver is unable to manage the required care at home due to 1 or more of the following:

Cognitive Limitations:

- Communication prevents learning care tasks (interpreter unavailable)
- Memory deficits prevents managing care tasks
- Perception or processing deficits

Physical Limitations:

- Physically unable to receive care (e.g., obese, wound location on back, contractures, unable to sit patient, no mechanical assists available)
- Lacks dexterity, motor strength, or skills required to manage care
- Comorbidity prevents management of care (e.g., blindness, paralysis)

In order to qualify, you must also show that treatment is precluded in a lower level of care and that there is a change or decline in functional ability



But, Cognitively Dependent People are Still Discharged to Independence.

- The majority (82 %) of physically independent patients in one study (N=155) were cognitively dependent at the time of discharge from IRF
- Most of these patients (82%) were discharged home alone or to the care of family. 11% were discharged home alone (**still cognitively dependent**).
- Problem solving and memory were the largest cause of dependence.
- Racial and ethnic minorities were more likely to be discharged dependent.



Rath et al., (2022)



What Do Actual Cognitive Rehabilitation Goals Look Like In a Plan of Care?

- Support for self-awareness, communication, initiation, and **help-seeking to identify needs, and seek and direct care** critical to managing medical associated conditions like diabetes, bladder infections, swallowing strategies, wound care.
- Support for **medication compliance**, initiation, and symptom monitoring.
- Support for communication and organization skills necessary for **collaboration with medical service providers**, appointment coordination, and compliance.
- Support for **comprehension of preventative and treatment-specific health information**.
- Support for a stable self-directed activity plan, **reducing attendant support** and increasing physical and cognitive activity that becomes associated with a healthier lifestyle.



More Cognitive Goals

- Support for the **regulation of behavior critical for compliance with medical interventions** like weight bearing restrictions, range of motion, or instructions intended to prevent contractures.
- Support for techniques of **behavior hygiene and regulation for necessary sleep**, critical to mood management, recuperation and healing. The role of cognition in good mental health, and the extension of mental health as critical to physical health, is clearly established.
- Support for **initiation and behavioral compliance in the mitigation of skin breakdown** for persons with TBI and SCI or multiple orthopedic and paresis conditions. Re-hospitalizations for wound care are a substantial driver of costs in chronic conditions.
- Support for **comprehension and communication skills central to engagement in healthy lifestyle choices** and sustaining healthy activities and relationships.
- The development of **self-awareness and safety mindedness** in cognitively impaired persons with **fall risk** or other community risk exposures.



Why Would Cognitive Rehabilitation Be Excluded?

Some forms of cognitive rehabilitation have been proven to be ineffective and unhelpful

- Computer-based drills, Ciccerone, 2005
- Lumosity controversy, 2016*



Problems:

- Rehabilitation without transferability
- Rehabilitation without generalizability
- Rehabilitation without functional relevance

Funders **should not** pay for this. It is not medically necessary, and it is not clear it helps. **It belongs in the dustbin of excluded benefits.**



*https://www.nytimes.com/2016/02/22/us/politics/22-rehabilitation-networks-are-often-a-better-way-to-keep-people-off-their-feet-than-actual-rehabilitation.html



Is It All Bad? “Dumpster Diving” for Rehab Gold!



ASHA

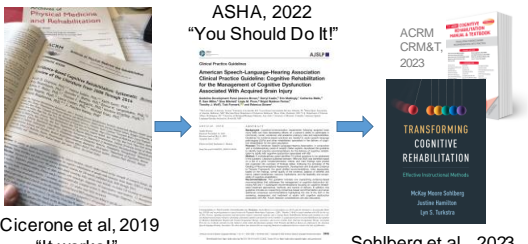
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What Does the Literature Say About Cognitive Rehabilitation?

1. Does It Work?
2. Should We Do It?
3. How Do We Do It?

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Cicerone et al, 2019
“It works!”

ASHA, 2022
“You Should Do It!”

ACRM CRM&T, 2023
TRANSFORMING COGNITIVE REHABILITATION
Practical Implementation Methods
Molly Hesse Sohlberg
Justin Huxford
Cari S. Torkelson

Sohlberg et al., 2023
“Do it this way!”

ASHA

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Does it Work? Meta-analyses of Cognitive Rehabilitation Interventions

- 2009 - 2014
- 186 included studies, 121 fully-reviewed
- Neurological diagnoses
- Sorted the evidence
 1. Practice Standards
 2. Practice Guidelines
 3. Practice Options



• Initiated by the Cognitive Rehabilitation Task Force of ACRM



Cicerone et al., (2019) HNRN NETWORK NEURO REHABILITATION

The Main Finding

• Comprehensive-holistic neuropsychological rehabilitation is **recommended** during post-acute rehabilitation to reduce cognitive and functional disability for persons with TBI or stroke, regardless of severity or time post injury.

Results: short and long term cognitive and functional gains for:

- independent living
- societal participation
- self-reports of well being and quality of life
- reduces caregiver burden
- reduces societal costs



Cicerone et al., (2019) HNRN NETWORK NEURO REHABILITATION

Other “Practice Standard” Level Findings

Treatments may include:

- Attention deficit training
- Visual scanning for neglect
- Compensatory strategy training
- Cognitive-linguistic therapies for language deficits
- Social communication deficits
- Metacognitive strategy training
- Gestural training for aphasia


...and a host of Practice Guidelines and Practice Options as well.



Cicerone et al., (2019) HNRN NETWORK NEURO REHABILITATION

This Meta-Analysis Also Found

No support for isolated use of computer resources for unmonitored training of cognition or perception




- Involvement and direction of a rehabilitation therapist
- Focus on attention, memory, executive dysfunction targets
- Should stimulate cognitive domains of interest
- Adjust task difficulty to patient performance
- Provide feedback & objective performance data

Cicerone et al., (2019) HOPE NETWORK NEURO REHABILITATION

What Cicerone (2019) Tells Us


...it works!

- But it is not clear what to do with that finding
- There have been new scoping reviews since that have revealed even more confirming research



Cicerone et al., (2019) HOPE NETWORK NEURO REHABILITATION

Should We Do It? ASHA Interdisciplinary Recommendations Project, 2022




ASHA
American Speech-Language-Hearing Association
Making effective communication, a human right, accessible and achievable for all.

Guideline Development Panel, Brown, J., et al. (2022) HOPE NETWORK NEURO REHABILITATION

Guidelines for Cognitive Rehabilitation from ASHA

American Speech-Language-Hearing Association (ASHA) and a **multidisciplinary panel** of experts developed evidence-based clinical practice recommendations for management of cognitive dysfunction associated with ABI



Guideline Development Panel, Brown, J., et al. (2022) HEAD NETWORK
NEURO REHABILITATION


Purpose

- Guideline developed to address rehabilitation needs of adults with cognitive dysfunction associated with ABI
- Describe and evaluate the current effectiveness of evidence-based cognitive treatment practices by SLPs
- Increase the treatment skills of SLP-care for individuals with TBIs
- Guidelines translate to a full interdisciplinary team

Guideline Development Panel, Brown, J., et al. (2022) HEAD NETWORK
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Systematic Search Scope

- 16 databases searched & peer reviewed
- 117 articles with 112 studies were included in the final analysis
- They analyzed 112 studies conducted from 1980 - 2020




Guideline Development Panel, Brown, J., et al. (2022) HEAD NETWORK
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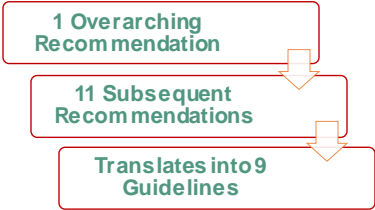
Clinical Questions: Getting Specific About Treatment

4 categories of questions

1. Does cognitive rehabilitation work?
2. Is restorative or compensatory treatment effective?
3. Is one form of treatment better than another?
4. In what setting is cognitive rehabilitation effective?



ASHA (2022) Cognitive Rehab Guidelines




1 Overarching Recommendation

11 Subsequent Recommendations

Translates into 9 Guidelines

Guideline Development Panel, Brown, J., et al. (2022)




Overarching Guideline

Evidence-Based Recommendation:
ASHA recommends adults with cognitive dysfunction associated with ABI receive cognitive rehabilitation that is clinician-directed, person-centered, and evidence-based.

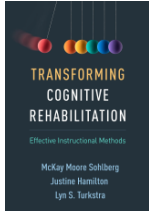
Clinician-directed, person-centered, and evidence-based cognitive rehabilitation is important for meaningful and functional patient outcomes

Goals for treatment are set together

Cognitive rehabilitation acts as a bridge between impairment and a fulfilling life



How Do We Do It?



- Sohlberg et al., (2023) provides EBP treatment guidelines in their new book
- They promote the use of the **PIE** (Plan, Implement, Evaluate) format to structure cognitive interventions

Sohlberg, M. K. M., Turkeltaub, L., & Hamblin, J. (2023). **ICF NETWORK NEURO REHABILITATION**

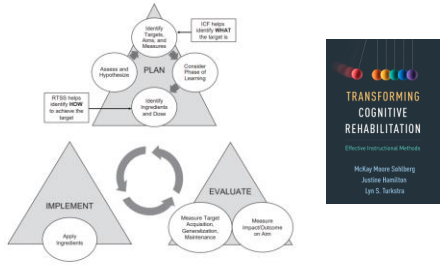


FIGURE 1.1. PIE Framework.

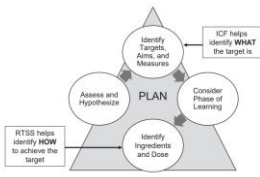
Sohlberg, M. K. M., Turkeltaub, L., & Hamblin, J. (2023). **ICF NETWORK NEURO REHABILITATION**

PIE Framework: Plan

Planning Step 1: Assess and Learn Client's Priorities

Planning Step 2: Hypothesize

Planning Step 3: Define Targets



Sohlberg, M. K. M., Turkeltaub, L., & Hamblin, J. (2023). **ICF NETWORK NEURO REHABILITATION**

Plan – Patient-Reported Outcomes

<p>Community Integration Questionnaire</p> <ul style="list-style-type: none"> For people with brain injury, can also be completed by a proxy Measures frequency of participation in activities or roles (15 items) <p>Community Integration Measure</p> <ul style="list-style-type: none"> For people with brain injury, community dwelling Measures experience /satisfaction with integration and participation <p>Functional Activities Questionnaire</p> <ul style="list-style-type: none"> For older adults with normal cognition, MCI, or mild to advanced dementia, in multiple clinical settings from acute care to home Measures functional changes in independence with ADLs 	<p>Multifactor Memory Questionnaire (MMQ)</p> <ul style="list-style-type: none"> For adults aged 39-91 Measures "How I Feel About My Memory" (18 items) Measures self-reported "Memory Mistakes" (20 items) Measures self-reported "Use of Memory Strategies" (19 items) <p>Patient-Reported Evaluation of Cognitive State (PRECIS)</p> <ul style="list-style-type: none"> For adults with self-reported cognitive challenges post-stroke Measures perceived impact of cognitive challenges (27 items) <p>Self-Awareness Multilevel Assessment Scale</p> <ul style="list-style-type: none"> For people with severe brain injury, to be filled out by a care partner Measures the level of self-awareness in order to direct the treatment plan
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PIE Framework: Implement

Implement the strategy identified

Ensure the patient...

1. Knows the goals of the strategy
2. Recognizes environments where strategy is useful
3. Believes the strategy will be useful
4. Demonstrates the strategy in tasks

Implement

Therapy Sessions: Carry out therapy sessions focused on cognitive training exercises, compensatory strategies, and functional activities.

Home Practice: Assign homework tasks that reinforce the strategies learned in therapy sessions. For example, have the client practice using a memory aid to remember appointments or tasks.

Environment Modification: Make modifications to the client's environment to support cognitive function.

PIE Framework: Evaluation

Evaluate

- Acquisition
- Generalization
- Maintenance
- Impact

Sohlberg, M. K. M., Turkstra, L., & Hamilton, J. (2020). HOPE NETWORK NEURO REHABILITATION

Evaluation

Progress Monitoring: Regular assessments are conducted to track the client's progress toward their established goals.

Feedback: Providing feedback to the client about their progress.

Adjustment: Based on the evaluation of the client's progress, the therapy plan may need to be adjusted.

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Guideline 2

Evidence-Based Recommendation:
Restorative and compensatory treatments are viable options for cognitive rehabilitation. Clinicians should tailor interventions to the needs of the individual and consider cognitive severity and stage of recovery when making treatment decisions.

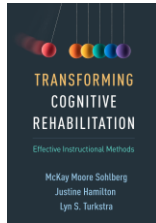
- Restorative interventions are important for reducing impairment and improving function.
- Compensatory interventions are important for managing impairment and limitations while improving function and self-awareness.

Guideline Development: Parot, Brown, J., et al. (2022). HOPE NETWORK NEURO REHABILITATION

Restorative and Compensatory Treatment for Attention Deficits

Example: Mr. Jones has an impaired ability to maintain attention after his TBI.

- **Restorative:** Clinician could recommend Attention Process Training (Barman et al., 2016)
- **Compensatory:** Clinician could recommend setting recurring alarms to stay on task, reducing external distractions, using earplugs at work, counsel on using best times of day to accomplish more cognitive-demanding tasks, develop self-talk strategies to get back on task



Guideline 3

Evidence-Based Recommendation:

Effective management of cognitive-communication impairments may include **domain-specific treatment approaches** targeting:

- impaired memory
- attention
- executive function, and/or
- social communication skills

...and include **one or more treatment approaches** for the management of generalized cognitive dysfunction.

Domain Specific vs. Generalized Treatments

Domain Specific (e.g., attention):

- Broad: Attend a college class
- Narrow: Take notes

Generalized:

- Use of an integrated planner system (paper calendar and smartphone) for memory, organization, and planning functions

Guideline 4

Evidence-Based Recommendation:

Cognitive rehabilitation can include activities using **decontextualized** and **contextualized** treatments.

- **Decontextualized** rehab is beneficial but not as strong as contextualized at posttreatment and follow-up outcomes
- **Contextualized** rehab is more patient-centered, and leads to increased participation, stronger patient-provider relationship, and more satisfaction with results



Guideline Development Panel, Brown, J., et al. (2022)



Example

Decontextualized:

- Presenting lists of unrelated words and asking the individual to repeat them or identify synonyms and antonyms

Contextualized:

- Complete tasks relevant to their job, such as answering phone calls, using a computer, or following work-related instructions.



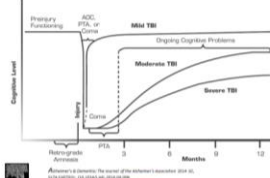
Guideline 5

Evidence-Based Recommendation:

Cognitive rehabilitation should be initiated as early as possible.

Treatment should be initiated and extended beyond the acute phase of recovery based on progress, trajectory of functional improvement, and individualized goals.

Recovery patterns from TBI



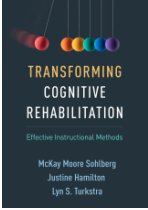
Guideline Development Panel, Brown, J., et al. (2022)



Cognitive Rehabilitation for Inpatient Setting

Initiating cognitive rehabilitation in the inpatient setting not only can increase cognitive functioning in the long run...

...but can also make the transition from inpatient to outpatient care **easier** when family members are a part of the treatment



Sohlberg, M. K. M., Turkeltaub, L., & Hamilton, J. (2022). *Transforming Cognitive Rehabilitation: Effective Instructional Methods*. HONOR NETWORK NEURO REHABILITATION

Examples of Cognitive Rehabilitation Goals in the Inpatient Setting

1. Improving Arousal and Attention
2. Developing Procedural Skills
3. Enhancing Memory Function
4. Managing Behavioral and Emotional Symptoms
5. Facilitating Communication
6. Preparing for Transition to Community

Sohlberg, M. K. M., Turkeltaub, L., & Hamilton, J. (2022). *Transforming Cognitive Rehabilitation: Effective Instructional Methods*. HONOR NETWORK NEURO REHABILITATION

Guideline 6

Evidence-Based Recommendation:
Use computer-based treatment programs when part of a clinician-directed, comprehensive cognitive rehabilitation plan.

- It is important to have cognitive rehabilitation trained clinicians **delivering the rehabilitation** for positive results.
- Self-directed computer treatment was shown, in one study, to have a **negative association** with cognitive and behavioral improvement.

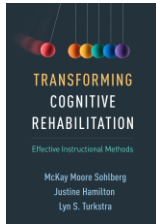
Guideline Development Panel, Brown, J., et al. (2022). *Transforming Cognitive Rehabilitation: Effective Instructional Methods*. HONOR NETWORK NEURO REHABILITATION

Computer-Based Treatment

Example: Patient with concussion, all symptoms went away except difficulty sustaining attention.

TYPICAL FORMAT for treatment:

- Weekly Clinic Sessions:
 - 5-minute check-in
 - 35-minutes of attention computer drills
 - 10-minutes for planning and updating exercises for at home use
 - Increased difficulty level after 80% accuracy on multiple trials in a row



Guideline 7

Evidence-Based Recommendation:

Consider group treatment to offer opportunities of peer interaction and generalization.

- Cognitive rehab can be just as effective, and in some cases more effective, in group setting as individualized rehabilitation. In group settings, individuals can develop skills learned in individual settings, and engage in peer interaction that can allow for a greater sense of support.
- The rehabilitation of social competence in a group setting has been shown to be more effective than in an individual setting
- Group or partner training gives patient the opportunity to practice behaviors; behaviors don't automatically generalize to untreated settings



Guideline Development Panel, Brown, J., et al. (2022)



Guideline 7 – Example Goals

- Taking turns in conversation
- Staying focused on the topic
- Listening to others
- Showing interest in the other person
- Asking questions of the other person
- Getting to the point
- Coming across as friendly and relaxed
- Being supportive of the other person
- Keeping emotions in check, and using a calm tone of voice
- Taking the time to speak as clearly as possible



Guideline 8

Evidence-Based Recommendation:

Consider telehealth to expand access to cognitive rehabilitation.

- Telehealth or remote therapy improves health care **accessibility** and allows those living in rural areas to access providers with specialized training and expertise.
- Acceptable for those who prefer advantages of **convenience, anonymity, and comfort** of receiving care in the home.
- Many CMS telehealth accommodations are approved through 2024, **but then need to prove they are effective** to continue.



Coleman et al., (2015)
Guideline Development Panel, Brown, J., et al. (2022)
Cheneseboth et al., (2018)



Guideline 9

Evidence-Based Recommendation:

Cognitive rehabilitation should consider demographic and other factors that may contribute to a patient's response to intervention.

- Many predictive factors can influence the trajectories of recovery from TBI.
- Awareness of characteristics or demographics can help navigate episodes of care, and knowledge of patients' tendencies, strengths, weaknesses, and general level of functioning helps to establish attainable goals.



Guideline Development Panel, Brown, J., et al. (2022)



Cognitive Rehabilitation is Interprofessional



Clinical Questions: ANSWERED

4 categories of questions

1. Does cognitive rehabilitation work? **YES!**
2. Is restorative or compensatory treatment effective? **YES. Both work.**
3. Is one form of treatment better than another? **NOT REALLY. They do different things.**
4. In what setting is cognitive rehabilitation effective? **When lead by a clinician in a personalized effort, there is good evidence of effectiveness in all settings.**



Takeaways

- Cognitive rehabilitation that is **patient-centered** and **evidence-based** should be considered for TBI patients with cognitive deficits.
- Both **restorative** and **compensatory** treatments should be used.
- Cognitive rehab should include **contextualized** treatments and it should be initiated as soon as possible.
- No one treatment plan is right for everyone. Professionals should take **individual** information into consideration when the creating plan of care.



THANK YOU

Questions?



Discussion Question:

- How are you documenting the use of evidence-based practice in your evaluations and notes
- How do you document the value of your interventions in the "evaluation" phase?



Discussion Question:

- What do the recommendations address that you think is most helpful
- What were you surprised did not make the list?
- How will the recommendations change what you do or propose?