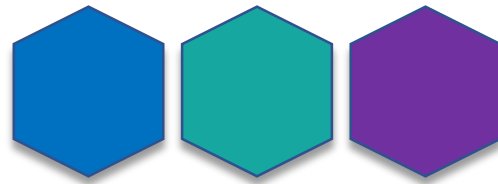


Cognitive Changes Following Brain Injury: Understanding Cognition & Developing Accommodations



Wendy Ellmo MS CCC/SLP, BCNCDS, CBHP
Brain Injury Specialist, Brain Links
Certified Brain Health Professional





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Brain Links

Who we are

Statewide team of brain injury specialists

What we do

We equip professionals to better serve people with TBI with current research-based training and tools.

- Family-friendly educational materials
- Resources for return to school and work settings
- Toolkits for Healthcare Providers, School Nurses, **Survivors and Families**, and **Service Professionals**: tndisability.org/brain
- YouTube Training Channel: youtube.com/@brainlinks830/playlists

Agenda

- ✦ What Cognition is
- ✦ Cognitive Domains or Subtypes
- ✦ How ACEs Change the Brain
- ✦ Cognitive Interventions
- ✦ Communication Suggestions
- ✦ Case
- ✦ Resources



Attention

Judgment

Memory

Cognition

A realistic human brain is centered in the image, surrounded by vibrant blue, ethereal energy waves or smoke-like patterns. The word 'Cognition' is written in a large, bold, black sans-serif font across the middle of the brain.

Flexibility

Awareness

Organization

Problem Solving

Reasoning

Attention

Attention – not a unitary skill

- ✦ Visual
- ✦ Verbal
- ✦ Task-specific

- ✦ How long (duration)
- ✦ How much (density)
- ✦ How hard (complexity)

- ✦ What environment
 - Distractions/no distractions
 - What type of distraction

Breaking it down:

- **Sustained Attention**
- **Divided Attention**
- **Alternating Attention**

- ✦ Get their attention first
- ✦ Include the modality that is best – add pictures, model the behavior, describe
- ✦ Shorten the length of time
- ✦ Give less information
- ✦ Simplify
- ✦ Control the environment
- ✦ Reduce visual distractions
- ✦ Reduce noise

Memory

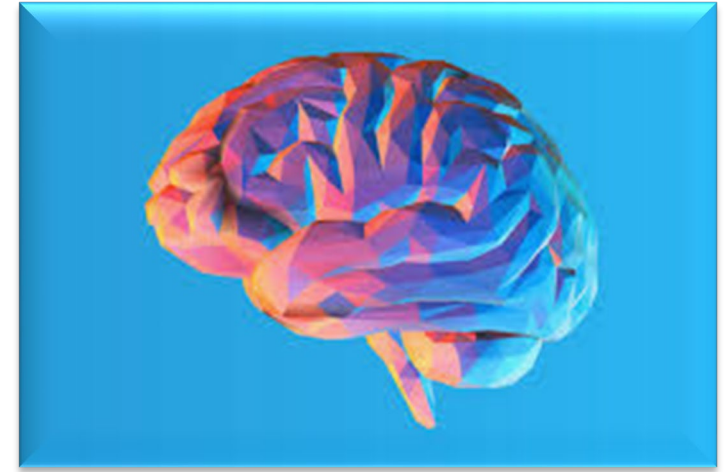
- **Short-term**
- **Long-term**
- **Working Memory**

- **New learning**

- **Episodic**
- **Procedural**
- **Declarative**
- **Semantic**

- **Verbal Memory**
- **Visual Memory**

- ✦ Write things down
- ✦ Repeat information
- ✦ Use lists, planners, pictures, cue cards, timers
- ✦ Cue where needed
- ✦ Use spaced rehearsal – reviewing the same info several times over time
- ✦ Create procedures and routines
- ✦ Use their strengths – visual or verbal
- ✦ Pause for processing before moving to the next step



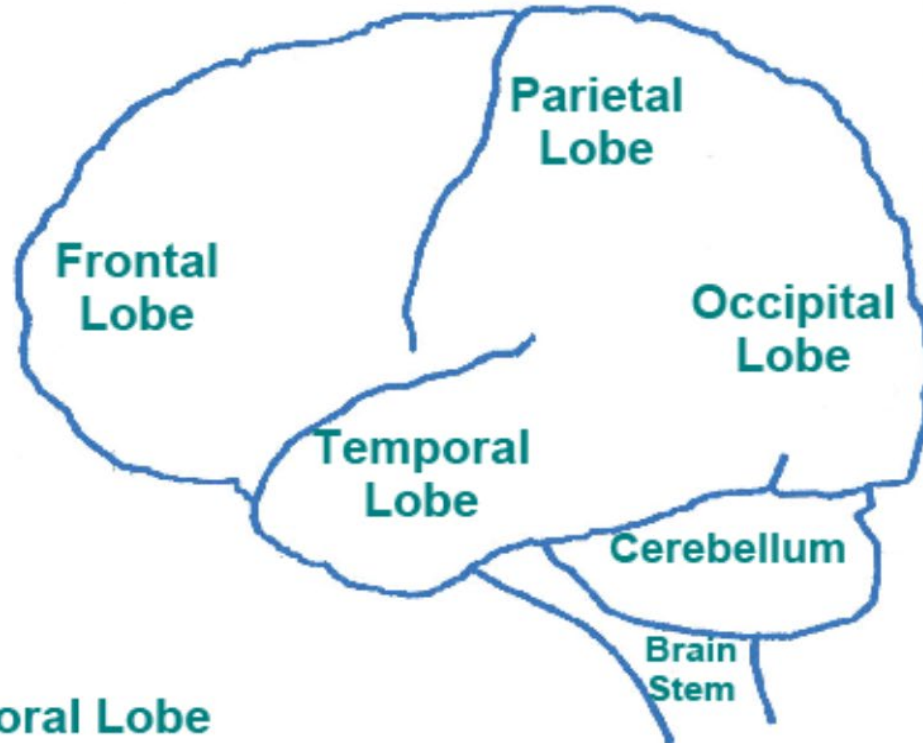
Simplified Brain Behavior Relationships

Frontal Lobe

- Initiation
- Problem solving
- Judgment
- Inhibition of behavior
- Planning/anticipation
- Self-monitoring
- Motor planning
- Personality/emotions
- Awareness of abilities/limitations
- Organization
- Attention/concentration
- Mental flexibility
- Speaking (expressive language)

Temporal Lobe

- Memory
- Hearing
- Understanding language (receptive language)
- Organization and sequencing



Parietal Lobe

- Sense of touch
- Differentiation: size, shape, color
- Spatial perception
- Visual perception

Occipital Lobe

- Vision

Cerebellum

- Balance
- Coordination
- Skilled motor activity

Brain Stem

- Breathing
- Heart rate
- Arousal/consciousness
- Sleep/wake functions
- Attention/concentration

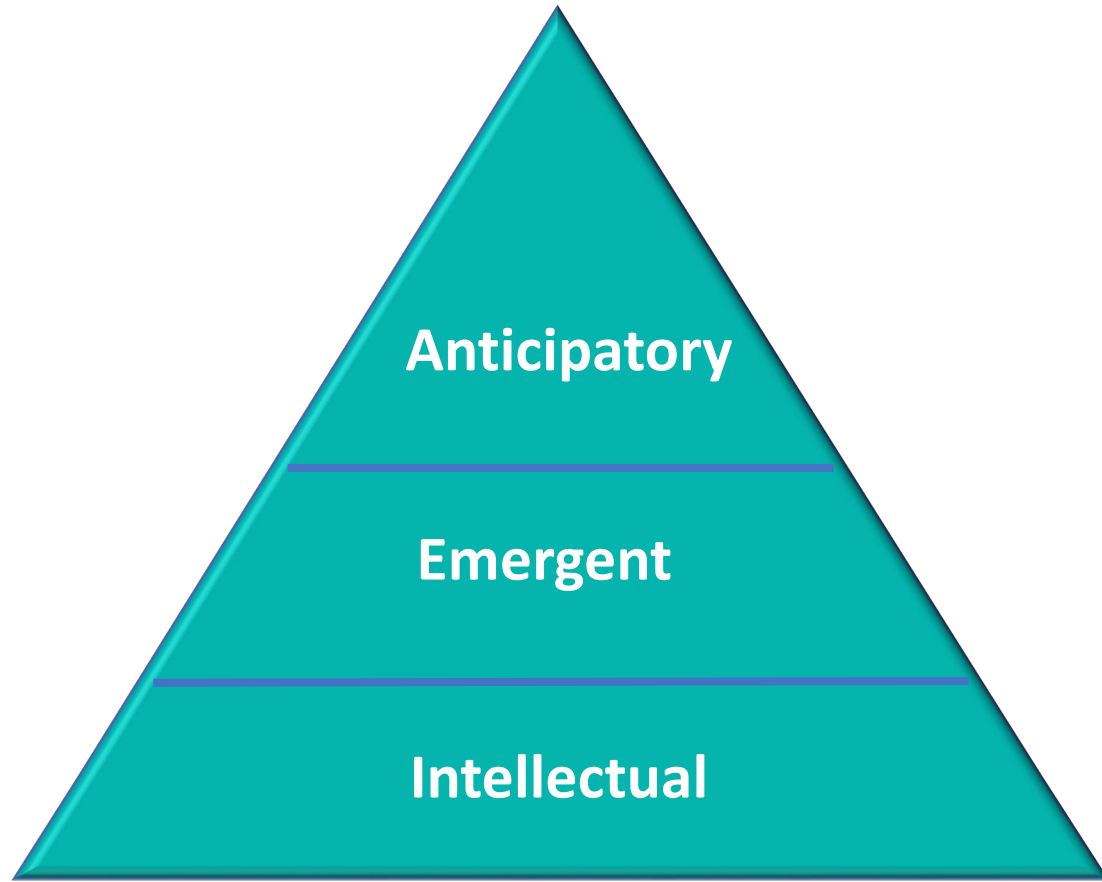
Executive Functions



- The brain skills you need to achieve a goal.
- Includes higher order skills of
 - **Initiation, planning, organization**
 - **Impulse control, self-monitoring**
 - The **flexibility** to change strategies as needed

Awareness

Hierarchy of Self-Awareness



(No Awareness)

Stop, Think and Plan, then Evaluate later

- Ask leading questions: Will anything be difficult, do you have anything that could help you, Will you need my help...
- Make a plan with strategies in place for any anticipated problems
- Then during Evaluation: how did it go, could anything or anyone have helped to make it go better, what would you do differently next time...
- Give feedback gently, always with a way to make it better

Metacognition

The Greatest Gift

Helping someone to become aware of the way they think:

- ✦ Strengths
- ✦ Weaknesses
- ✦ Strategies/Tools



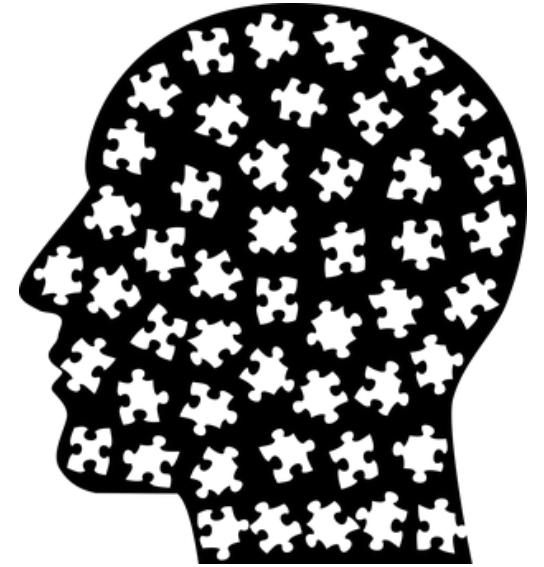
- ✓ Initiation
- ✓ Planning
- ✓ Organization
- ✓ Completion

Initiation

- Make a schedule with clear start times
- Use a timer or Alexa
- Get agreement to remind them when to start
- Follow a routine

Planning

- Use a planner or wall calendar
- Write down steps with a check-off
- Routinely consult the plan
- Use drawings or pictures if helpful



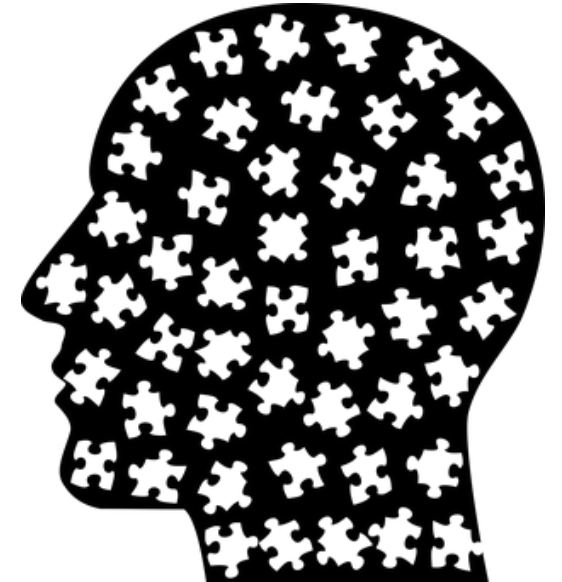
- ✓ Initiation
- ✓ Planning
- ✓ Organization
- ✓ Completion

Organization

- See above
- Everything has a place and is put back in it's place
- Color coding
- Categories
- Pictures to show what goes where
- Write all the steps down, then put in right order

Completion

- Check off all steps
- Photo of what done looks like
- Cues to keep going



Charlie's daily tasks didn't get done... Why?

Flexibility Reasoning Problem Solving

YOGA



Extreme “Stuckness” → Perseveration

Ex: Autism, but also Brain Injury

Flexibility

- Allow the inflexibility when it's not hurting anything/anyone. Sameness can be comforting
- Remember it's the brain
- Brainstorm different ways beforehand

Reasoning/Problem Solving

- Use questions to assist
- Encourage thinking it through: what would happen if we did it that way
- Write each part down to help with memory

Judgment Perception Abstract Thinking



Judgment

- First identify **all** options
- Then weigh all options
- Help to think them through to the end
- Put it down on paper

Perception

- Make sure they are “seeing” things clearly

Abstract Thinking (a very high level skill)

- May need to make things more concrete
- Watch figurative language and idioms
- May need it explained

Adverse Childhood Experiences (ACEs)

Big study showed:

Potentially traumatic events can have negative, lasting effects on health and well-being

ACEs are things like:

Economic hardship

Divorce or separation

Victim or witness of violence

Physical, emotional or sexual abuse

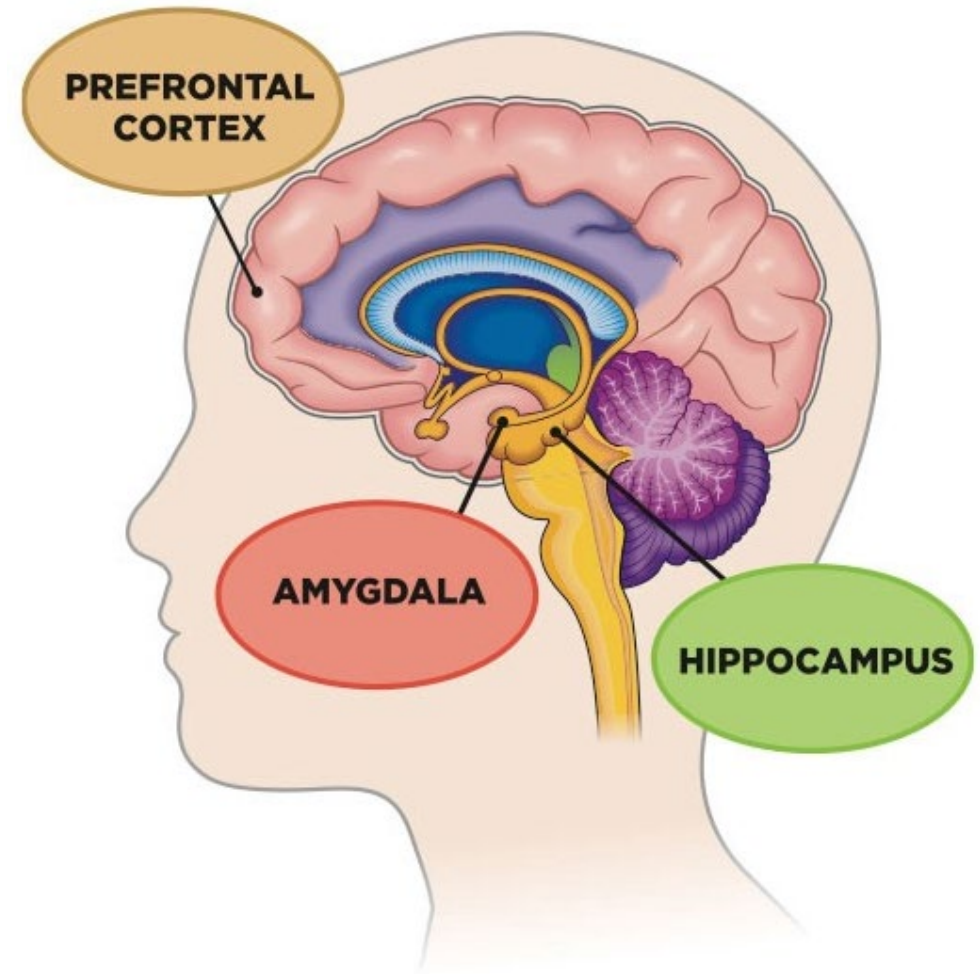
Growing up in a family with mental health or substance use problems

A family member who is incarcerated



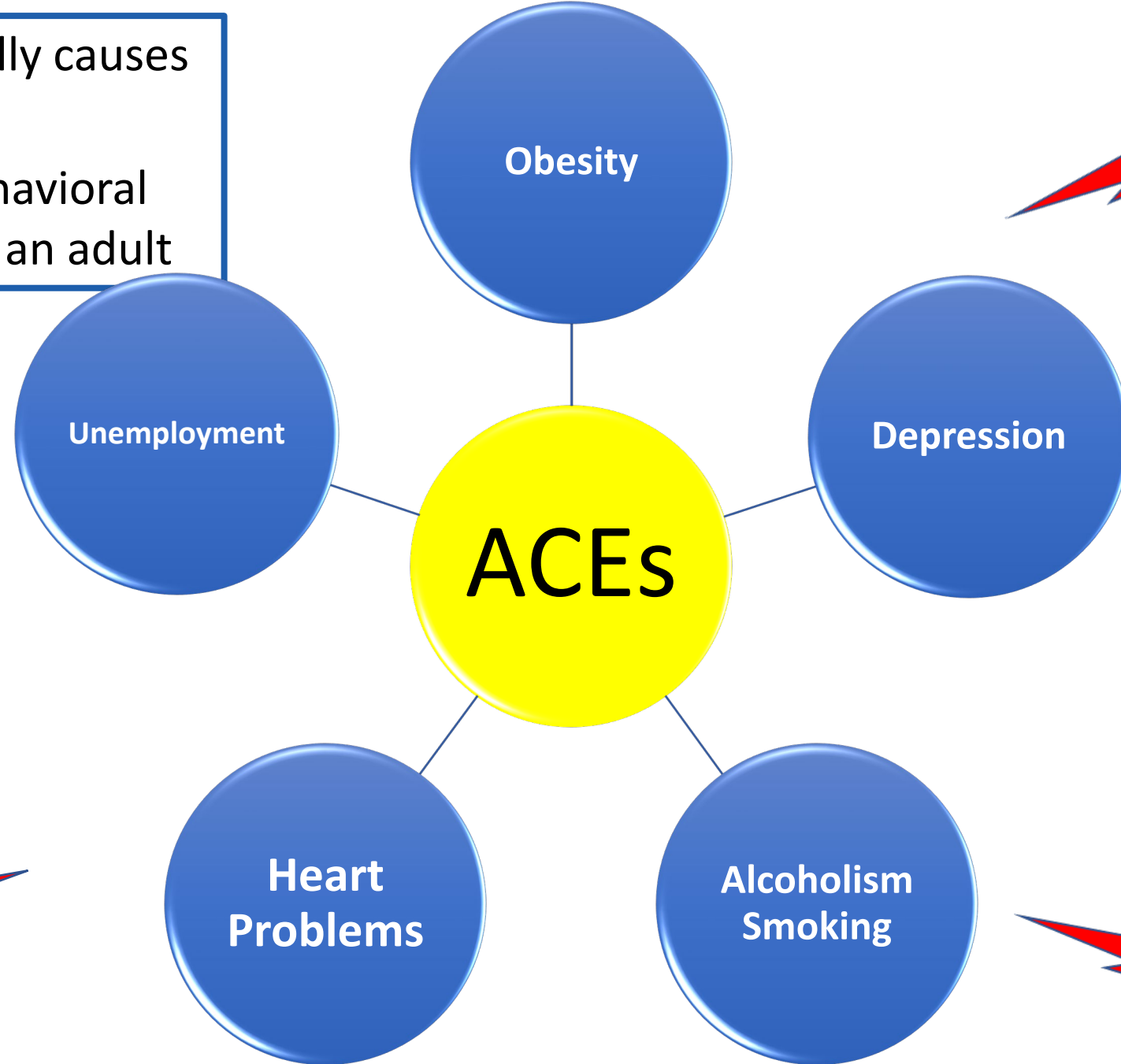
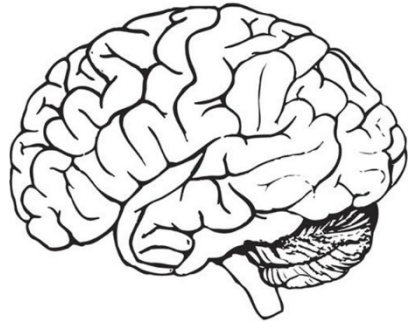
Brain with Stress...

- The PFC & Amygdala are activated.
- How quickly the messages stop between the PFC & Amygdala = how quickly you recover from that stress.
- Greater resilience = greater connections between Amygdala & PFC and greater activity in the PFC in general.
- The greater the PFC activity, the greater recovery.
- The quieter the Amygdala, the better the PFC can plan and act without negative emotions in the way.



This chronic stress literally causes changes in the brain.

Can lead to negative behavioral and health outcomes as an adult



ACEs

Children with ACEs much more likely to develop

- ✦ **Mood disorders**

- ✦ **Poor executive functioning**

Decreased decision-making skills

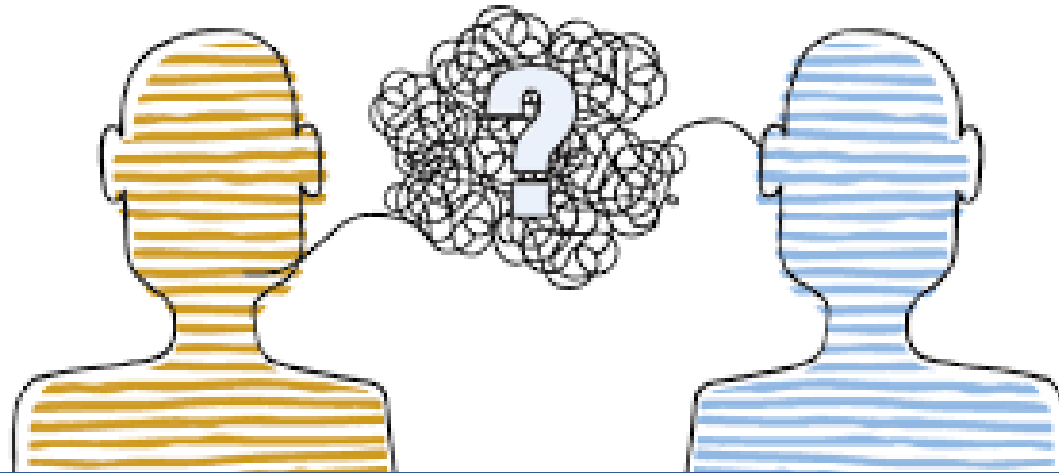
Poor judgement

Poor impulse control



Language

- Cognitive changes impact language
- Language itself may not be disrupted after TBI
(but it might be after a stroke)



Receptive Language



Speed



Duration



Complexity

Information Processing

- Talk slower
- Pause more
- Use less information and/or words
- Simplify vocabulary
- Simplify grammar
- Simplify the overall topic
- Control distractions
- Make sure they have understood

Receptive Language

Also need to consider:

- ✦ **Distractibility – what type of environment do they need?**
- ✦ **Won't necessarily ask questions – may not realize they didn't understand**



Expressive Language

- ✦ **Amount of talking – too much/too little**
- ✦ **Organization**
- ✦ **Tangential (sidetracking)**
- ✦ **Finding Words**
- ✦ **Complexity**
- ✦ **Prosody (change in tone)**
- ✦ **Perseveration**



- Provide structure
 - Talks too little: “Tell me two things”
 - Talks too much: “Tell me one thing”
- Organization cues: What happened first, next;
- Tangentiality: “That’s interesting, but go back to where you started with...”; “I want to make sure we answer your first question...”
- Word finding: Get agreement about whether you can fill in the word for them or not, cue them to what usually works for them – try to picture it, think of the first letter
- Complexity
- Prosody
- Perseveration: redirect when needed, engage them in their topic when possible, add new info to their topic (remember it’s the brain)

Language

✦ Look at cognitive problems and see how they impact language

Receptive Language Example:

Cognition: Attention and Awareness problems

Result: **Not understanding, but don't ask questions because they don't realize**



Expressive Example:

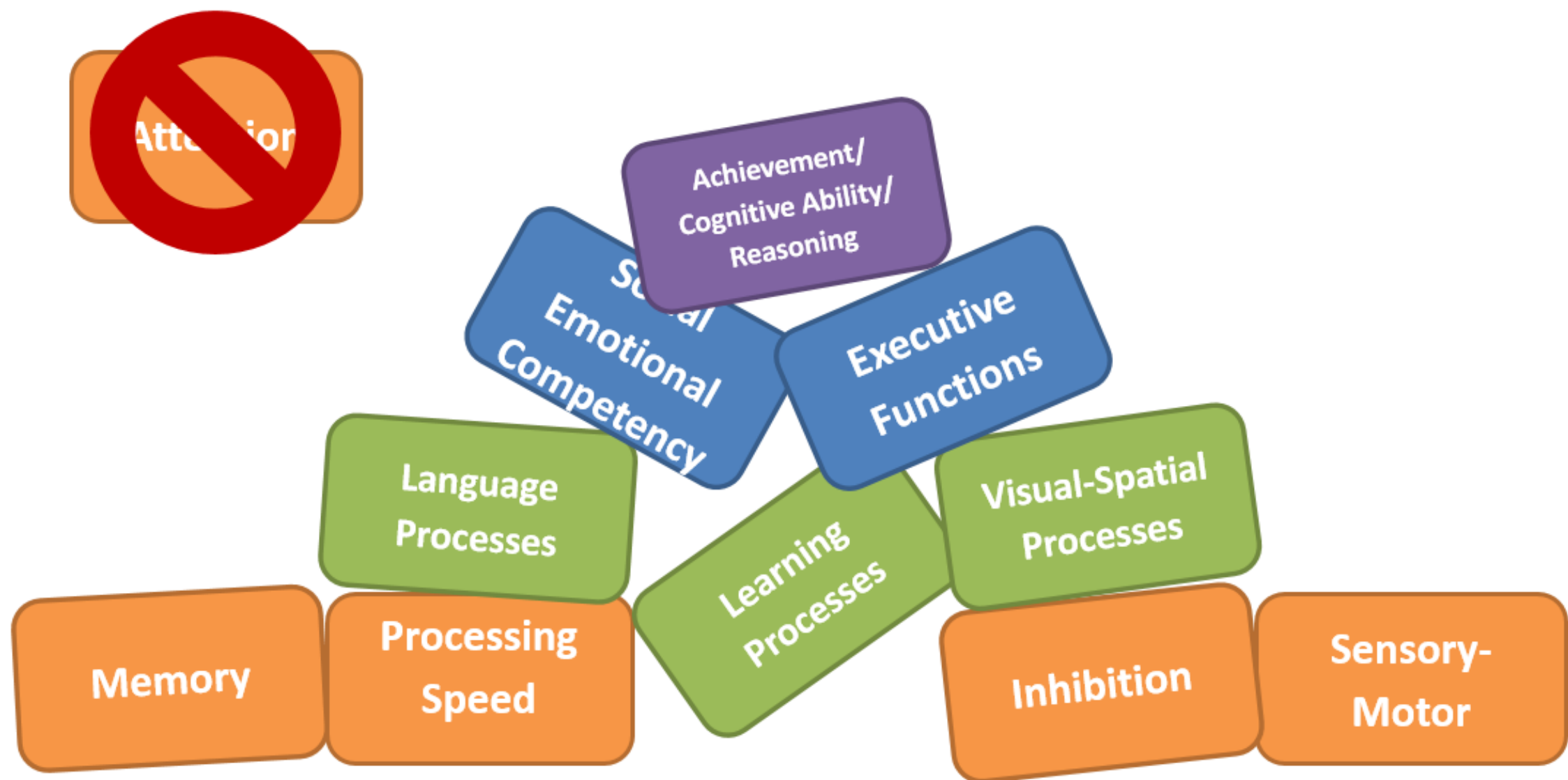
Cognition: Disorganized and perseverative

Result: **Retell of day jumps all over and tends to keep coming back to one event**

Building Blocks of Brain Development



CO Brain Injury Steering Committee: Adapted from Miller, 2007;
Reitan and Wolfson, 2004; Hale and Fiorello, 2004



The Hierarchy of Neurocognitive Functioning © - created by Peter Thompson, Ph.D. 2013, adapted from the works of Miller 2007; Reitan and Wolfson 2004; Hale and Fiorello 2004.

The Building Blocks of Brain Development © – further adapted by the CO Brain Injury Steering Committee, 2016.

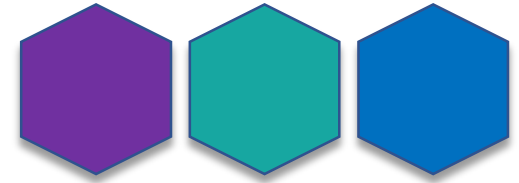
Dig Deeper into Problem Areas

Charlie is “Forgetting”

- Memory
- Attention
- Depression
- Lack of organization
- Initiation
- Something else?



Behavior



Keep in mind:

The cognitive challenges along with the behavior

The cognitive challenges may be the reason for the behavior

- ✦ Identify triggers

Always look at **communication** and **cognitive demands**

- ✦ Is the behavior a communication? What is it communicating?

- ✦ Involve them in solutions and methods

- ✦ Practice alternative behaviors/responses



Learn People's Patterns

Won't vs Can't

Things that Make Cognition & Behavior Worse

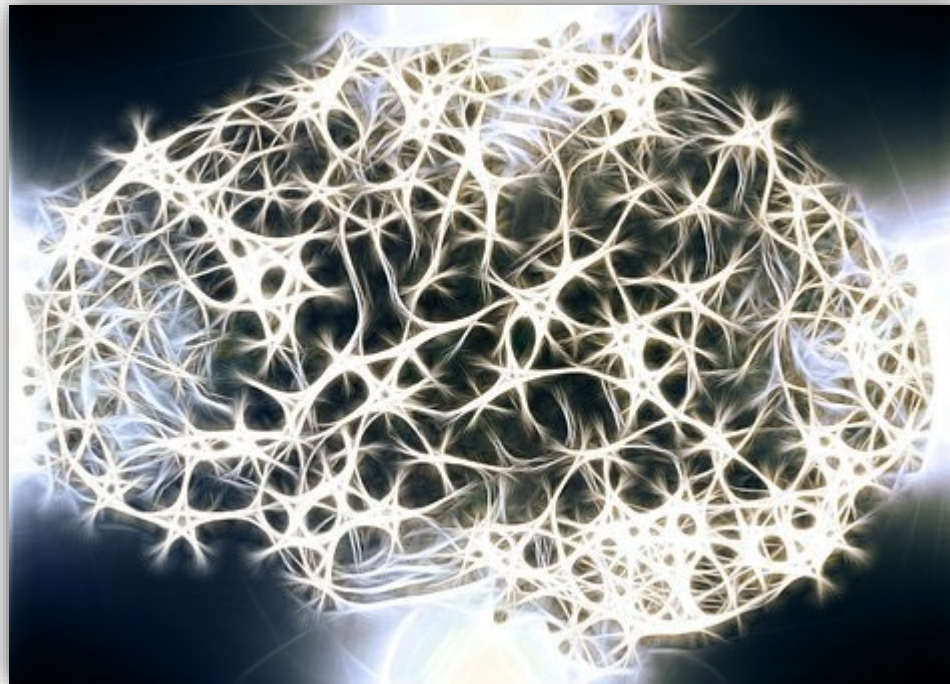
Tired

In Pain

Stressed

Sick

Emotional



**Under the
Influence of
Drugs or Alcohol**

Gathering Information



- Observation (looking for patterns)
- Case notes/file
- Medical file
- Neuropsychological testing – the “**Gold Standard**” for cognition
- Cognitive Linguistic testing by a Speech Language Pathologist

Determining Strengths & Challenges

Use:

- ✦ Speech and Language Evaluation
- ✦ Neuropsychology Evaluation
- ✦ Other Evaluations
- ✦ And the Brainstorming Solutions Tool

See more on



Brainstorming Solutions Tool

Person Served: _____

Date: _____

Current Challenge: (describe as completely as you can: what circumstances, what the difficulty is, what the environment is like)

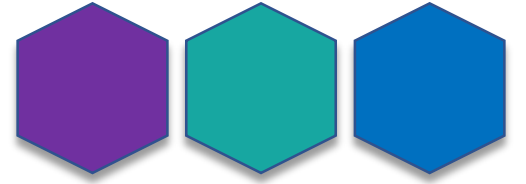
What goal of theirs will solving this help them achieve? _____

Directions: Write what you know about each area. Give examples if helpful. Consider how the environment [the situation around them] impacts them. For each area, write what helps them. Fill out only the areas that make sense for this challenge or this person. After completing this Brainstorming Solutions Tool (BST), use the Strategies and Accommodations Tool (SAT) to help decide which strategies will help the person.

Abilities

Attention (consider visual, verbal, how long the person can pay attention)	
Memory Storage (consider visual, verbal, ability to learn new information, remembering short term or long term)	
Memory Retrieval (what helps the person to pull information out of their memory)	
Processing Speed (how fast or slow does someone need to talk for the person to best understand)	
Initiation (is the person able to start things on their own or do they need help getting started)	
Awareness (does the person know they have a problem with something, do they know when it is happening, can they predict when it will happen)	
Impulse Control (can the person stop themselves from doing or saying something)	

Brainstorming Solutions Tool

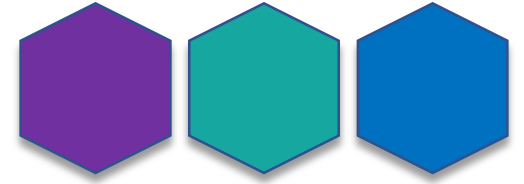


Cognitive Areas:

- ✦ Attention
- ✦ Memory (storage & retrieval)
- ✦ Processing speed
- ✦ Initiation
- ✦ Awareness
- ✦ Impulse control
- ✦ Flexibility
- ✦ Understanding language
- ✦ Speaking
- ✦ Organization
- ✦ Planning
- ✦ Problem solving
- ✦ Judgement



Brainstorming Solutions Tool



- ✦ Vision
- ✦ Hearing
- ✦ Motor Ability
- ✦ Fatigue

- ✦ Social
- ✦ Emotional State
- ✦ Environment

Recent Changes

Medication
Injuries/Illnesses
Other
Did a problem start or get worse when the change was made?

Brainstorming Solutions Tool

Solutions (Things to try) / Strategies	
What I need to do to support them? (Exs: cue the person when they forget, point to a picture reminder, do the step they can't)	
Internal Strategies the person can use (repeating it to themselves, asking themselves a question when they get stuck, a rhyme)	
External Strategies the person can use (a calendar, a checklist, pictures, a timer, an app, their phone, a notebook, organizing bins)	
Environment Changes (close doors, get rid of noise, get rid of clutter, put what they need near the door)	
Share the proposed solutions/strategies with the person, listen to their suggestions and concerns and get their okay to try the new approach.	
The person's thoughts, ideas and concerns	The person should always be included in developing a plan- esp. a behavior plan.




- Evaluate
- Plan for next time

Strategies & Accommodations Tool

- ✦ Used along with the Brainstorming Solutions Tool
- ✦ Matches area for area plus Assistive Technology
- ✦ Initial Key – who can help
- ✦ Lots of choices of strategies to try

See more on



 **Strategies & Accommodations Tool**
for People with Brain Injury & Cognitive Changes

Person Served: _____ Date: _____

Directions: Use the Brainstorming Solutions Tool (BST) first, to help you figure out the person's strengths and weaknesses. Then use this tool (SAT) to **check off the strategies that might be helpful** for each area you identify on the BST. When possible, complete this form with the person served and discuss the strategies with them. Ask the person if there are other strategies or ways of communicating with them that might be helpful.

For each area:

- Consider whether there is any assistive technology (AT) that might help (see AT section at end).
- The initials after each type of strategy (ex: **Attention**^{SLP OT NP}) indicate someone who may be able to help develop additional strategies (see the initial key below).
- This is not a complete list of strategies, but can be used to help you think of other ideas.
- **Be patient and respectful.**

Attention^{SLP OT NP}

- ☐ Visual reminders to focus, like a sticky note
- ☐ Positive reinforcement for staying focused
- ☐ Change task more frequently
- ☐ Reminders to check work

Memory^{SLP OT NP}

- ☐ Use a planner (check-off system)
- ☐ Written & verbal directions for task
- ☐ Post directions or pictures
- ☐ Frequent review of information
- ☐ Reminders for completing a task

Processing Speed^{SLP NP}

- ☐ Slow down when talking, wait for responses
- ☐ Give one step at a time
- ☐ Be direct and clear

Initiation^{SLP NP}

- ☐ Remind the person that it is time to begin
- ☐ Break down task into steps, help with first task and decrease assistance with each step
- ☐ Use a calendar or planner to show when things are to be started
- ☐ Use encouragement to keep going once started
- ☐ Use a timer or alarm on watch or other device the person prefers

Awareness^{SLP NP}

- ☐ (Gently) help person to see where they are having difficulties & what they could do about it
- ☐ Give reminders to use strategies when they are not aware of a potential problem
- ☐ Ask them if they know where they are having an issue before you try to help them

Impulse Control^{SLP NP C BS}

- ☐ Teach the person to stop and think before acting

INITIAL KEY

The initials next to the areas indicate people who may be able to help develop other strategies for that area. The person served may be working with these professionals, or you may have them on your team. You can also ask your supervisor. Always seek help if needed.

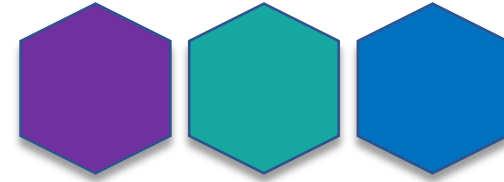
SLP: Speech Language Pathologist
OT: Occupational Therapist
PT: Physical Therapist
NP: Neuropsychologist
C: Counselor
BS: Behavior Specialist
AUD: Audiologist

Cognitive Rehab (in a Nutshell)



- ✦ Understand their cognition*
 - Through NP testing, observation and reports of people who know them
 - Strengths and weaknesses
- ✦ Form an alliance – (Person Centered Practices help build this alliance)
 - Build relationship
 - Get agreements around goals/outcomes and strategies
- ✦ Determine level of support needed (for each task)
- ✦ Develop strategies*
 - Internal
 - External

Case: Doug



TBI sustained in a car accident. Usually very pleasant, but has angry outbursts at times for unknown reasons.

Outbursts often happen in the kitchen during meal prep with others, and out in the community. The radio is often on during meal prep to keep things light and fun. Doug often needs cueing to complete tasks to the end.

Directions often have to be repeated and he is slow to respond with his answer when asked questions. He has weakness in his right arm and hand.



Frustration Scale

Calm/Happy

Getting Upset/Frustrated

Too Late/I'm Gone

1

2

3



Personal Guide

Purpose

- ✦ For raising understanding/ metacognition
- ✦ Good for the older child/teen and their caregiver; adult

Content

- ✦ States that make performance worse
- ✦ Strategies to help
- ✦ Situations that will challenge them
- ✦ Understanding what distracts you
- ✦ Eliminating distractors
- ✦ Use old strategies



PERSONAL GUIDE FOR EVERYDAY LIVING AFTER CONCUSSION/TRAUMATIC BRAIN INJURY

This guide was developed to help you better understand what you may be experiencing following your injury. The better you can understand the conditions that can impact you, the situations that are more difficult and the strategies to try, the more you will succeed in life.

“CONDITIONS” likely to make symptoms worse:

- A. Being **TIRE**D
- B. Being **EMOTIONAL** – sad, frustrated, excited, angry, etc.
- C. Being **UNDER PRESSURE**, being **RUSHED**, **STRESSED** or **ANXIOUS**
- D. Being **DRUNK/UNDER THE INFLUENCE** of drugs (Prescription or not)
- E. Being in **PAIN**
- F. Being **SICK**

STRATEGIES to consider for each state:

- A. **Tired:** Do not allow yourself to become tired. **Plan** things that you need to do and complete them early whenever possible. **Slow down** and **check** your work. Stick to a fairly regular sleep schedule and make sure you get enough sleep at night.
- B. **Emotional:** If you become emotional, **slow down** and **think before** you speak or act. Remember that being tired can make you become more emotional. If you know that you are going into a potentially emotional situation, **plan** as much as possible so that you are ready.
- C. **Stress/Pressure:** Avoid being rushed, stressed or under pressure by **planning**. Lay out things to do in a **planner** (calendar), allowing plenty of time for each task. Especially when you are rushed, **slow down** to allow yourself time to think clearly and look for missed details. Take the time to make **checklists** so nothing is missed. **Check** off each step as it is completed.
- D. **Alcohol/Drugs:** Do not drink alcohol or take drugs. Period. Many people with brain injuries report feeling out of control enough without adding to it with alcohol or drugs. Know that your symptoms are likely to be enhanced while you are under the influence. Know also that drugs and alcohol have been reported to lower seizure threshold, making your chances of having a seizure greater.
- E. **Pain:** Avoid getting in pain in the first place. Do pain management exercises as recommended. Take medications as prescribed. Use proper body mechanics, etc. When avoiding pain is not possible, attempt to relieve it as soon as possible. Keep expectations realistic when you are in pain. Know that pain medications may affect your thinking ability. **Allow more time** to do things when in pain. **Plan ahead**. **Check** your work.

Staff TBI Skill Builder

Build Knowledge and Skills to Support People with Brain Injury

Staff TBI Skill Builder is a 14-module, on-line training program designed for frontline staff new to working with adults with brain injury across a range of settings (e.g., residential support programs, day programs). Skill Builder can also be used as a refresher course for staff with more experience working with this population.



learn cbirt

<https://learn.cbirt.org/1/course/view.php?id=15>

Other Resources

- Service Coordinators – TN's TBI Program
 - Will provide help
 - No cost

<http://www.braininjurytn.org/service-coordination.html>

- Virtual Support Groups


- TN Family Support Program

<https://www.tn.gov/didd/for-consumers/family-support.html>

Tennessee Traumatic
Brain Injury

**Service
Coordination
Program**

*Assisting people with brain injuries,
their families and professionals*



Tennessee Department of Health
Traumatic Brain Injury Program
1-800-882-0611



NEXT WEBINAR

February 8, 2024
10:00 - 11:30 Central Time



*Behavioral & Psychosocial Changes Following
Brain Injury: Tips, Strategies & De-escalation*

REGISTER TODAY!



Thank you and survey

Take the 1 minute
survey!
Get a certificate of
attendance

