CRAIG HOSPITAL | NEUROREHABILITATION & RESEARCH HOSPITAL

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Thinking and Cognition After BI

Difficulties with thinking, understanding, remembering, and processing information are called cognitive difficulties. Cognitive difficulties are common after brain injury (BI).

Cognitive skills build on each other, like building blocks. Learning new information requires being alert, oriented, and able to pay attention, and then to remember what was learned. The information can then be used to perform other activities such as organization, reasoning, and decision making. Post-traumatic Amnesia (PTA) or Post-traumatic Confusional State (PTCS) is the period of time after a BI when arousal, awareness, and attention are impaired. During this time it is challenging to focus attention or remember any new information. This period of disorientation or confusion can be the result of symptoms related to the injury of the brain itself, medications, and/or healing and recovery.

Improvement beyond this state represents an important milestone in the rehabilitation process. Staff will track PTA and will note when this period of time ends (i.e. emerging from PTA). Knowing where you are, what day it is, and the events that led up to being at Craig are all signs of emerging from PTA. This is called orientation.

Signs of confusion and disorientation include:

- Mixing up times and tasks throughout the day
- Difficulty remembering routines and daily activities
- Confusing past and present events
- Trouble knowing the correct date, situation, and/or location
- Trouble recognizing people
- Difficulty remembering things about themselves, such as age, relationship status, etc.

Rev. 1/2026
Publication # 903

What You Can Do

- Orient the person frequently. For example, give a reminder: “You are at Craig Hospital; you had an injury; it is June.” You may even need to remind them of what year it is.
- Give the correct information; do not quiz the person.
- Encourage the use of their planner to write in daily activities. Refer to the planner yourself throughout the day.
- Help keep a consistent routine of tasks and activities. Avoid changing the routine as much as possible.
- Provide simple explanations of what you are doing and why.

Arousal and Attentional Changes

Arousal and attentional changes may occur, including difficulty waking up, staying awake, and responding to information. These types of arousal problems can be challenging. Sometimes medications are used to increase somebody’s alertness.

Once alert, it can still be hard to stay focused or attentive. Sustained Attention is being able to focus on one task, even briefly. Selective Attention is the ability to tell the difference between two or more things and decide to focus on one while “tuning out” or filtering the other(s). Divided Attention is the ability to focus on more than one task at the same time.

Signs of attention difficulties include:

- Being easily distracted
- Difficulty attending to more than one thing at a time; problems with multi-tasking
- Restlessness and periods of agitation
- Difficulty initiating and/or maintaining eye contact while having a conversation
- Difficulty staying on topic during a conversation

What You Can Do

- Focus on one task at a time. Avoid making abrupt changes in activity or topic.
- Maintain eye contact when talking and encourage the individual with BI to do the same.
- Eliminate distractions: limit the number of people in the room, turn off any external noise (music, television), turn bright lights down or off.
- Limit the number of people talking at one time. One at a time is best.
- Gently re-focus the person's attention to the activity/conversation if they seem distracted.
- Ask the person to repeat information after it's been told to them to help the person remember the main points.
- Offer brief and frequent rest periods.

Speed of Processing

Speed of processing refers to how quickly we take in information, make sense of it, and then respond. Individuals with BI often feel like they're moving in slow motion compared to the pace of life going on around them:

- It may take longer to understand things that were easy to understand before.
- It may take longer to answer questions and a longer time to react, especially in emergency situations.

What You Can Do

- Allow time to answer questions, read things, or learn new information.
- Limit the number of people and amount of information. Speak at a normal rate but slow enough for the person process.
- Keep directions simple and to the point.

Memory Impairments

Individuals with BI frequently have difficulty with short-term memory (remembering new information and retaining it from moment to moment and day to day). Long-term memory (or remembering things from the past) often remains a strength. Problems with short-term memory can make it hard to learn new information, including:

- Tasks from one day to the next
- Names
- Any other verbal or written information

What You Can Do

- Encourage use of the planner/memory system provided by the SLP
- Encourage writing new details in the planner, such as what happened in therapies
- Keep the current date on the whiteboard, and encourage use of a watch
- Avoid quizzing when something isn't remembered. Instead give the correct information
- Sometimes the brain attempts to fill in memory gaps with information that did not happen. This is called confabulation. This is not done on purpose. If this occurs, find a way to double check the information (e.g., checking their planner, checking with someone they know was there). If this becomes upsetting, move on to another topic.

Changes in Initiation

After BI, it may be hard to initiate a task, or follow steps, which is referred to as sequencing.

- It may seem as if there is a lack of interest or motivation.
- It may be difficult getting started or following-through once a task begins. Cueing and reminders may be needed to keep going once a task is started.

What You Can Do

- Work with the team to create routines and write down the sequence of steps for tasks, as needed. Refer to the plan, and encourage checking off each step as it is completed.
- Work with the team to make a task list or to-do list each day and use it to check off tasks as completed.
- Establish a timetable for completing tasks so the expectation of completing tasks and how long they should take is known.
- Provide specific choices. For example, ask, “Would you like to do A or B?”
- Point out when success in starting and completing a task without help occurs.

Other Executive Functions: Cognitive Flexibility, Organization, Setting Goals, Problem-Solving, and Judgment Executive functioning skills are complex thinking skills that include thinking flexibly, recognizing strengths and weaknesses, setting realistic goals, organizing, planning, and solving problems. These higher-level cognitive skills are needed to function successfully at home, school, work, and in relationships.

Cognitive Flexibility is the ability to think creatively about a problem or switch from thinking about things one way, to thinking about them in a different way. This can mean finding more than one solution to a problem, or being able to generalize. Generalizing is applying a skill to more than one situation. For example, after learning to transfer from the wheelchair to the mat in therapy, this skill can be generalized to transfer into a car, etc. Signs of difficulty with cognitive flexibility include having trouble:

- Tolerating or adapting to change.
- Moving from one activity/topic to another; “getting stuck.”
- Seeing different points of view.
- Coming up with another solution for a problem when the first solution doesn’t work.

Another executive skill is the ability to recognize one's own strengths and weaknesses, also called self-awareness or insight. Without self-awareness a person may have unrealistic expectations, and may strive for goals that are too difficult to reach. Examples of problems with this include:

- Statements such as "I couldn't do that before the injury either."
- Demonstrating over-confidence with their abilities.

Setting realistic goals can be difficult following BI. This requires self-awareness, and problem solving. The ability to anticipate and solve problems is another important part of executive functioning. The ability to anticipate a problem involves considering the situation, recognizing your own limitations, planning ahead, and thinking about the consequences of an action. The ability to solve a problem involves considering options and choosing the best one. Examples of difficulties with these skills include:

- Making decisions too quickly
- Making decisions that could be harmful or problematic
- Not considering all the information
- Struggling to work through new or unfamiliar problems

Organization is the ability to group items, thoughts, tasks, etc. together in useful ways. Signs of difficulties with organizational skills may include trouble with:

- Finding important items such as keys or wallet
- Paying a bill on time or following a budget
- Refilling medications before they run out

Planning involves recognizing strengths/weaknesses, anticipating problems, setting realistic goals, problem solving, and then identifying the steps that need to happen to reach a goal. Planning may be simple or more complex with multiple steps. For example, a person may worry about being understood because of slurred speech. Planning out strategies to practice before getting together with old friends can be helpful. Difficulties with planning may affect:

- Estimating the time needed to complete the task
- Saying or thinking through the steps to complete something
- Gathering the supplies needed for a task

What You Can Do

- Use organizational tools offered by the therapy team. This may include: To-Do lists, calendars, phone reminders, or planners.
- Think through options to solving a problem. Are there obstacles that might get in the way of these options? Point out when good decisions are made.

Rancho Los Amigos Levels of Cognitive Function

When the BI has been from trauma rather than from disease (such as stroke), recovery is likely to follow a general pattern. The Rancho Los Amigos Levels of Cognitive Function were developed at Rancho Los Amigos Hospital in California. These are eight to ten stages of the recovery process from diffuse traumatic brain injury (for information about diffuse injuries see the "About the Brain" section). You may also hear the initial stages of this process referred to as Disorders of Consciousness. Not every person with a TBI will go through all these stages. Each person progresses individually and the stages may overlap. Still, the levels of cognitive function can be a useful guide for staff and family members in understanding the person's progress and how best to help.

Level 1 – No Response (Coma)

- Appears to be in a deep sleep.
- Does not respond to sounds, sights, touch, or movement.
- Does not open eyes, speak, or move body parts on purpose.

Level 2 – Generalized Response (Unresponsive Wakefulness Syndrome, Vegetative State)

- Eye opening, moving arms and legs in response to sounds, sights, touch, or movement
- Responds slowly and inconsistently.
- Responds in the same way to what he or she hears, sees, or feels. Responses may include chewing, sweating, breathing faster, moaning, moving, and/or increasing blood pressure.
- Responses are often reflexive and not under voluntary control.

What you can do for level 1 and level 2:

- Provide small amounts of varied stimulation (talking, TV, touching), as the team suggests.
- Speak as if he/she understands.
- Use a soothing, calm voice, with a normal volume and pace.
- Try to not talk about medical information in front of the person.

Level 3 – Localized Response (Minimally Conscious State)

- Occasionally following commands like raising a hand, opening eyes.
- May begin pulling at tubes and lines.
- May look at people and follow movement or sound.
- Responses are delayed and not consistent.
- Awake on and off during the day.

What you can do for level 3:

- Provide a low stimulation environment: small amounts of stimulation (talking, TV, music, touching) with breaks in between.
- Bring in favorite belongings and pictures of family members and close friends.
- When interacting, give the person at least 10 seconds to respond.
- Keep comments and questions short and simple.

Level 4 – Confused- Agitated

- Increasing awareness of surroundings, increasing movement and responsiveness.
- May be confused and frightened and not understand what is happening
- May be highly focused on his basic needs such as eating, relieving pain, going back to bed, going to the bathroom, or going home.
- Memory is better for past events than recent ones, unable to remember day to day.
- Easily overstimulated, which may be shown by yelling, physical aggression, or an inability to relax.
- Attention is limited, can only perform a task for a short period of time.
- May fill in gaps in memory by giving detailed accounts of made up events (confabulation).

Level 5 – Confused- Inappropriate, Non-Agitated

- Overstimulation/agitation is decreased, may still occur with fatigue.
- Can pay attention longer and follow simple instructions, but becomes distracted easily.
- Memory is better for past events than recent ones, decreased ability to remember day to day
- May be able to follow through on routine activities, but not initiate them.
- Unable to see changes from brain injury. May feel ready to go home, be alone, and/or do things without help.
- May fill in gaps in memory by confabulating.

What you can do for level 4 and level 5:

- Gently remind the person where he or she is and that he or she is safe.
- Bring in familiar pictures, posters, favorite things.
- Keep the environment quiet and calm. Turn off the TV, limit talking, and use a calm voice.
- During periods of agitation or confusion, redirect to another topic or activity. If this does not work, give the person time alone (or with staff) to calm down.
- If the person says something incorrectly, give the correct answer and then move on. Try not to argue.
- Keep comments and questions short and simple.
- May need safety devices or one on one supervision.

Level 6 – Confused- Appropriate

- Attention span is sufficient for conversation, but not for lengthy, complex information.
- Beginning to retain some day to day memories.
- Unable to see problems from brain injury, may express feeling ready to go home.
- More aware of physical problems than thinking problems.

What you can do for level 6:

- Encourage the individual to write notes about the day or questions that arise.
- Encourage the individual to participate in activities they enjoyed before the injury.
- Give feedback and help with social situations and provide emotional support.

Level 7 – Automatic- Appropriate

- Little to no confusion with day to day memory but difficulty remembering details.

- Impaired ability to solve problems and plan ahead.
- Some understanding of problems, but is unable to relate them to “real life” situations.
- May appear bored, depressed, or irritable due to supervision and restrictions.
- Able to perform routine self-care without help
- Inflexible or rigid thinking, may seem stubborn.

What you can do for level 7:

- Offer assistance if needed in planning and organizing daily schedule.
- Encourage increased independence with routine household tasks.
- Begin addressing barriers to future return to work or school, if indicated.

Levels 8, 9 & 10 – Purposeful- Appropriate

- Requires progressively less assistance to complete daily living tasks
- Shows greater independence and asks for assistance more appropriately
- Difficulty planning/managing time and remembering information.
- Less emotional control and less tolerance for frustration than before.
- Increased understanding of deficits and how they affect functioning.
- May be unable to respond quickly or appropriately in an emergency or stressful situation.

What you can do for level 8, 9, 10:

- Encourage techniques to compensate for memory deficits.
- Support a gradual return to school or work with guidance from your therapy team.
- Provide understanding and support in emotional situations.
- Encourage continued involvement with community support groups.