

Pathways To Comfort: Dealing With Pain And Brain Injury

A Companion Guide To The Road To Rehabilitation Series

Step 3: Cognition/Memory

What are cognition and memory?

The dictionary definition of cognition is "the mental process or faculty of knowing, including aspects such as awareness, perception, reasoning, language, memory and judgment." Cognition, thus, includes all of the brain's mental input and output. Memory is a set of active processes that encode information ("package" the information so that is easier to remember), store information (which includes constantly re-arranging what is already in storage) and locate and retrieve information, as it is needed. Very few kinds of brain injury, such as viral infections deep within the brain, can impair memory without impairing other aspects of cognition. In the vast majority of cases, however, memory impairment is part of a more broad cognitive impairment.

What are the cognitive effects of brain injury?

The brain is our organ for thought, emotion and behavior. Injury can disrupt any or all of these brain functions, including the brain's ability to integrate functions and produce complex behavior. The only way to reliably identify the specific impairments of any given person with brain injury is through careful interview and examination of that person and, equally as important, detailed interviewing of the person's loved ones and caregivers.

How do I learn what all the technical terms mean?

There are hundreds of terms of specific components of cognition, and it is hard for anyone to keep track of them. If you become confused by technical terms, your best approach is to ask the professional to give you an example grounded in real-life behavior. In fact, doing so is useful even if you are not confused.

What are the types of cognitive functions?

The most useful way to understand the cognitive consequences of brain injury is to know some of the basic categories of cognitive functions.

- **Mental Power:** This is the basic, raw energy that supports mental activity. Mental powers refers to functions such arousal level (coma being an example of not enough power), concentration span and mental stamina. The brain areas involved in generating and regulating mental power are very vulnerable to brain injury and many people with brain injury have impairment in this area.
- **Specific Cognitive Abilities:** This refers to a person's stored fund of skills, abilities and knowledge, and includes items such as reading, writing, language, comprehension, motor skills and visual-spatial skills.
- **Executive Abilities:** This a very large category of cognitive functions and includes abilities such as anticipating future needs and planning accordingly, setting priorities,

regulating impulses and drives, self-awareness and self-correction. In essence, these are the capacities that allow a person to organize and to effectively deploy his or her mental power and specific cognitive abilities. The primary cause of impaired executive functions is frontal lobe injury, which is frequent in brain injury because of bruising and/or bleeding in this region of the brain.

Can cognitive deficits affect personality and emotion?

Cognitive impairments definitely can affect personality and emotion. For example, to be considerate and empathetic a person must have the cognitive ability to maintain two lines of thought simultaneously -- what he or she wants and what the other person wants. A deficit in this cognitive function can result in the person appearing self-centered and selfish, even when the intentions were otherwise.

The experience of having cognitive impairment in itself is frightening and discouraging, often leading to depression and anxiety. A competent cognitive treatment program will pay close attention to such emotional issues and will have the capacity to provide psychological and psychiatric treatment as needed.

What is the course of cognitive impairment?

The unusual course of cognitive deficits is that they are most severe just after injury, with an improving course thereafter. A commonly used rule of thumb is that recovery is rapid in the six months after emerging from coma, and it continues at a slowing pace for the next one to three years. However, there are many exceptions and not everyone has a smoothly improving road to recovery. When a person is showing an unstable, flat or negative course of cognitive recovery, medical complications should be suspected and evaluated.

How are cognitive impairments identified?

The professions which offer treatment for cognitive impairments (typically neuropsychology, occupational therapy and speech/language pathology) use tests specially designed to identify cognitive deficits, and they incorporate this information into their treatment planning process. Tests, however, are only part of a good assessment. Equally important is assessment of the person's real-life functioning (" he has a great IQ, but can he tie his shoelaces ") which includes the observations and perceptions of family and caregivers. The functional assessment is especially important for identifying impairments in executive functions ("if left alone, does he tie his shoelaces").

What happens during recovery?

Dead nerve cells do not regenerate, but injured cells can recover function. Moreover, the secondary effects of the original injury, such as brain swelling, can improve and allow healthy areas of the brain to function more effectively. In addition to healing, the brain has some capacity for reorganizing its circuits so that the remaining healthy nerve cells take over some of the functions of the damaged cells. In addition to biological mechanisms of recovery, there are behavioral and cognitive mechanisms. These mechanisms fall into two categories, learning and compensation. Damaged nervous systems are capable of learning new behaviors; the learning may be slower than before

injury and less complete, but in most cases some capacity for new learning remains. Learning can sustain additional recovery long after the biological healing processes are over. Compensation refers to techniques where assistive devices or procedures are used to overcome impairments that cannot be modified through learning.

What treatments are available?

Problems such as poor mental stamina or poor attention and concentration respond well to fatigue management techniques and also, in certain cases, can be treated with medications. Deficits that are restricted to specific cognitive skills are treated using stimulation and training to improve the skill involved, with compensatory techniques and devices added to the treatment as needed. Deficits in executive functions usually are treated in comprehensive programs which address such deficits in real-life social and community settings. Comprehensive programs view their mission as being to help the person with brain injury rebuild his or her overall level of function and quality of life. Treatment in such programs has a broad focus that includes interpersonal and social skills, work and social behaviors, emotional adjustment and self-acceptance and using cognitive skills in real-life settings.

About The Author

Joseph Bleiberg, PhD received his doctorate in psychology from Boston University in 1977. He is board-certified in clinical neuropsychology and is a clinical associate professor of neurology at Georgetown University School of Medicine. He currently is at the National Rehabilitation Hospital (NRH), where he has been the director of psychology since 1985. Before coming to NRH, Dr. Bleiberg was director of psychology and of behavioral studies research at the Rehabilitation Institute of Chicago, and assistant professor of psychiatry at Northwestern University School of Medicine.