

## The Functional Impact of Brain Injury

Functional changes following brain injury are different than broken bones that heal over time. While broken bones eventually heal, cognitive, sensorimotor and behavioral deficits can result in lifelong changes in how an individual functions in society. Any one of the functional changes discussed here can significantly affect every aspect of a person's life.

Most people who have survived brain injury have impairments in several areas, which complicates independent living, work and relationships. Some people have physical changes such as paralysis, or loss of limb that may alter their ability to move about. Many have emotional problems, including depression or severe mood swings. Most often cognitive problems, such as memory loss, difficulty with problem-solving and decision-making, are prominent. Changes in behavior after brain injury present special difficulties; in some cases, behavioral changes such as aggression or property destruction can present additional rehabilitation challenges.

**Cognitive Impairments** can affect activities of daily living, including hygiene, meal preparation, household management, community reintegration and many other aspects of day-to-day living.

**Memory Impairments** are considered to be the most disabling consequence of brain injury. Impaired memory affects a person's ability to learn, retain and use new information. In many cases, memory problems significantly affect a person's ability to live independently.

**Executive Functioning** refers to the ability to plan, initiate, direct, and monitor one's activities much like what an executive does to keep a business running. It involves organizing, planning, creating, evaluating and initiating projects and activities in many ways. Executive functioning defines an individual's ability to engage in meaningful tasks, whether necessary or enjoyable, and evaluates performance. It is a large part of being able to understand oneself.

With impaired executive functioning, a person may not respond to stimulation from the environment in the same way he or she did before a brain injury. For example, a common response to a difficult situation, or some type of over stimulation



may be yelling, throwing things, or being aggressive toward another person. These unwanted behaviors might be related to a person's inability to accurately recognize the problem or poor judgment in arriving at a solution.

**Initiation Impairments** may result in a person failing to engage in an important activity unless prompted. It is easy to see how failure to pursue interpersonal relationships, work, perform hygiene or maintain a safe residence can affect a person's ability to live independently.

**Speech and Language Impairments** can take many different forms. Impaired word-finding abilities, repetition of words or phrases, disorganized spoken or written communication and incomplete or incoherent expression of thoughts are common following brain injury. Speech and language problems can be receptive (the ability to understand others) or expressive (the ability to express oneself to others).

**Sensorimotor Impairments** vary, depending on the location and extent of the brain injury. Sensorimotor impairments can be localized to one extremity or side of the body. In other cases, effects may be generalized and affect most muscle groups and sensory modalities. When individuals have a combination



## Functional Impact of Brain Injury *continued*

of sensory deficits, it can have a major functional impact on the person's autonomy. For example, when impaired vision is combined with balance and coordination problems, it can affect the person's motor skills, hand-eye coordination, dexterity, spatial orientation, depth perception and other areas of functioning.

Impairments can include:

- variations in weight or body temperature
- variations in appetite
- constipation or incontinence
- headaches or seizures
- paralysis or paresis (weakness) of one or more limbs
- balance or coordination problems (ataxia)
- difficulty planning muscle movements (apraxia)
- increased muscle tone (spasticity) or decreased muscle tone (flaccidity)
- decreased endurance
- swallowing difficulties (dysphagia)
- vision problems or impaired depth perception
- involuntary eye movements (nystagmus)
- increased sensitivity to light (photophobia) or sound (sonophobia)
- hearing impairment or ringing in the ear (tinnitus)
- impaired ability to smell (anosmia) or taste
- increased sensitivity to touch (tactile defensiveness)
- chronic pain

Behavioral and Emotional Changes are common following brain injury. The behavioral changes listed below may have a major impact on a person's ability to live independently.

In addition to the cognitive, sensorimotor, behavioral and emotional changes individual's can experience, they may also have temporary or ongoing medical issues. Medical issues can further affect changes while complicating evaluation and treatment. Behavioral changes may include the following:

- ability to respond to requests
- aggression or property destruction
- yelling and angry outbursts
- self-injury
- decreased frustration tolerance
- depression and emotional swings (lability)
- impulsivity and hyperactivity
- inappropriate sexual behavior
- immature self-focused behavior
- hoarding

- decreased sensitivity to others
- paranoia

Substance Abuse is another area of concern for rehabilitation professionals working with individuals with brain injury and their families. Individuals with pre-injury substance abuse history may not have difficulties right after an injury due to limited access to substances. Physical and cognitive impairments may affect their ability to obtain drugs or alcohol. However, substance abuse difficulties can arise when an individual is able to gain access to drugs or alcohol. Substance abuse can be related to any of the following factors:

- increased access
- depression
- isolation
- increased awareness of limitations
- reacquainting with friends who misuse substances
- denial that substance abuse is a problem
- poor coping strategies
- limited therapeutic recreation outlets
- limited vocational opportunities
- pre-injury pattern of use or abuse ❖

*Excerpt from The Essential Brain Injury Guide, Edition 4.0*  
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RainbowVisions Magazine  
Rainbow Rehabilitation Centers, Inc.  
5570 Whittaker Road, Ypsilanti, MI 48197, USA  
E-mail: rainbowvisions@rainbowrehab.com