

## **What Impact Will Moderate or Severe TBI Have on a Person's Life?**

Article from Mount Sinai Medical Center, Brainline.org (preventing, treating and living with traumatic brain injury (TBI))

### **What are the typical long-term effects?**

In considering the long-term effects of TBI on the individual, it is most important to emphasize that there is no "typical" person with TBI. People who have experienced a TBI vary on many dimensions: 1) severity of initial injury; 2) rate and completeness of physiological healing; 3) types of functions affected; 4) meaning of dysfunction in the individual's life, in the context of his/her roles, values, and goals; 5) resources available to aid recovery of function; and so forth. Thus, the most important point to emphasize is that the consequences will be different for each individual injured.

In discussing possible effects of TBI, the immediate physiological recovery (which may continue over months and years) was discussed in a prior question. When the moderately or severely injured person has completed this initial recovery, the long-term functional deficits associated with TBI come to the fore. What areas of functioning may be affected by injury to the brain? Any or all of the functions the brain controls may be impacted. However, given that individuals differ greatly in their response to injury, any specific individual may experience only one, a few, or most of the possible effects. Further, a change in any of the possible areas of dysfunction, if it occurs at all, will vary in intensity across individuals - from very subtle to moderate to life threatening.

It is important to be aware also that not all functions of the individual are impacted by TBI. For example, feelings toward family, long-term memories, the ability to ski or cook, one's knowledge of the world, and so forth - all may be intact, along with numerous other characteristics of an individual, even one who has experienced a moderate to severe injury.

The possible long-term effects of moderate-to-severe brain injury are discussed in the following three questions.

### **How are thinking and other aspects of cognition affected?**

Individuals with a moderate-to-severe brain injury most typically experience problems in basic cognitive skills: sustaining attention, concentrating on tasks at hand, and remembering newly learned material. They may think slowly, speak slowly, and solve problems slowly. They may become confused easily when normal routines are changed or when the stimulation level from the environment exceeds their threshold. They may persevere at tasks too long, being unable to switch to a different tactic or a new task when encountering difficulties. Or, on the other hand, they may jump at the first "solution" they see, substituting impulsive responses for considered actions. They may be unable to go beyond a concrete appreciation of situations, to find abstract principles that are necessary to carry learning into new situations. Their speech and language

may be impaired: word-finding problems, understanding the language of others, and the like.

A major class of cognitive abilities that may be affected by TBI is referred to as executive functions - the complex processing of large amounts of intricate information that we need to function creatively, competently and independently as beings in a complex world. Thus, after injury, individuals with TBI may be unable to function well in their social roles because of difficulty in planning ahead, in keeping track of time, in coordinating complex events, in making decisions based on broad input, in adapting to changes in life, and in otherwise "being the executive" in one's own life.

With appropriate training and other supports, the person may be able to learn to compensate for some of these cognitive difficulties.

### **How are mood and behavior affected?**

With TBI, the systems in the brain that control our social-emotional lives often are damaged. The consequences for the individual and for his or her significant others may be very difficult, as these changes may imply to them that "the person who once was" is "no longer there." Thus, personality can be substantially or subtly modified following injury. The person who was once an optimist may now be depressed. The previously tactful and socially skilled negotiator may now be blurting comments that embarrass those around him/her. The person may also be characterized by a variety of other behaviors: dependent behaviors, emotional swings, lack of motivation, irritability, aggression, lethargy, being very uninhibited, and/or being unable to modify behavior to fit varying situations.

A very important change that affects many people with TBI is referred to as denial (or, lack of awareness): The person becomes unable to compare post-injury behavior and abilities with pre-injury behavior and abilities. For these individuals, the effects of TBI are, for whatever reason, simply not perceived - whether for emotional reasons, as a means of avoiding the pain of fully facing the consequences of injury, or for neurological reasons, in which brain damage itself limits the individual's ability to step back, compare, evaluate differences, and reach a conclusion based on that process.

With appropriate training, therapy, and other supports, the person may be able to reduce the impact of some of these emotional and behavioral difficulties.

### **What other changes are likely after moderate/severe TBI?**

Any of the ways we have of sensing/perceiving may be affected by TBI. Vision may be affected in many ways: loss of vision, blurred visual images, inability to track visual material, loss of parts of the field of vision, reduced depth perception, and sometimes disconnection between visual perception and visual comprehension, so that the person does not know what he or she is seeing. Changes also may occur in the senses of hearing, smell, taste, and touch; the individual may become overly sensitive or

insensitive. Further, the person may have difficulty sensing the location of his/her own body in space. Other individuals with TBI may have recurring problems with balance, vertigo, and ringing in the ears.

A relatively small percent of individuals with TBI experience seizures. For most of these, the initial onset of seizures occurs soon after injury. For others, the onset may take place up to several years post-injury. Two types of seizures may occur. Major motor seizures refer to what were once called grand mal seizures and involve loss of consciousness and vigorous, uncontrolled movement of the major muscle systems. Local motor seizures do not lead to loss of consciousness and involve less muscle movement. Some individuals with TBI use anti-convulsive drugs to prevent seizures or stop them during the course of a seizure.

If motor areas of the brain are damaged, the person with TBI may experience varying degrees of physical paralysis or spasticity, affecting a wide variety of behavior from speech production to walking. Damage to brain tissue can also evidence itself in chronic pain, including headaches. Also, evidence is growing that hormonal, endocrine, and other body systems are affected by the brain injury. Consequently, the individual may lose control of bowel and bladder functions, may sleep poorly, may fatigue easily, may lose appetite for food or be unable to control eating, and/or may be unable to regulate body temperature within normal boundaries. Women with TBI often experience menstrual difficulties.

### **Why are we poor at predicting outcome?**

The severity of the injury and the resulting direct effects on the individual's body systems may not predict the amount of impact in a person's life. This follows, first and foremost, because each of us draws in different ways on differing parts of our brains. For example, a severe injury to the frontal brain area may have less impact on an agricultural worker's job performance than a relatively mild frontal injury would have on a physicist's work. In sum, the meaning of the various patterns of injury and the associated changes in any person's life will depend on preinjury lifestyle, personality, goals, values, resources, as well as the individual's ability to adapt to changes and to learn techniques for minimizing the effects of brain injury.

We know in general that the variability of patterns of change associated with brain injury are shaped by many factors: the severity of injury and age at injury, time in coma, time since injury, length of PTA, the resources and services available to the injured person, the barriers met or advantages offered within different social contexts, the social and role demands that exist within the individual's life, and so on. How these factors work, in what ways, and how often is not clear. We know that TBI hits people differently, but have less knowledge of the number of people that experience various types of consequences and the specific factors affecting this.

## **What can I do to help the process of recovery?**

Immediately after injury, friends and family who want to help should focus on insuring that the injured person receives medical care that will minimize the effects of injury. This usually means that the person should be receiving care in a medical center that specializes in trauma care. This topic is covered more fully in another question, *What Is the Course of Treatment for Those with Moderate/Severe TBI?*

Once issues of life-and-death have been addressed, the person's functioning as a cognitive, emotional, and social entity comes to the fore. The individual is faced with many or a few of the possible changes described in preceding questions.

It has been suggested (by Kay and Lezak in 1990) that "recovery" is a misnomer and that "improvement" better describes what happens in the long run after TBI. The word recovery may, inappropriately, suggest that the effects of TBI will disappear, similar to symptoms vanishing when we recover from a cold. With TBI, some of the effects may truly dissipate after one year, two years, or more, but more frequently these long-term changes linger on, subtly or not so subtly, changing only slowly, if at all, over the life course.

What must be kept in mind at all times is that impairments that are due to injury of brain tissue can be helped through reeducation of the individual and through modification of the environment. Thus, for example, although the brain circuits involved in memory may never function in the ways and at the levels found before injury, remembering (a necessary skill in day-to-day life) may be improved by the individual's learning compensatory skills, such as using a daily diary to remember appointments, and by adjusting parts of the environment (alarm clocks, computer reminder programs, and family members) to jog memory.

The boundary of improvement is set by the individual's ability to learn new ways of doing things or to relearn formerly familiar skills. Since the brain mediates all learning and the brain is damaged, learning is often slow and/or incomplete.

The major role for friends and family at this stage of recovery is to help find resources that will help the injured person in addressing emotional, cognitive, physical, and behavioral challenges. A variety of resources are available on this Web site, including publications, linkages to other Web sites and information about rehabilitation trials that may help people with cognitive difficulties, mood disorders and fatigue.

Some individuals with TBI largely move away from the notion of "recovering" the pre-injury self. They reach a point, instead, when they view the losses/changes/deficits as "simple facts" or even "opportunities." For these people, terms such as "devastation" and "loss" get redefined and no longer are seen as applying to them. Their injury has let them see other possibilities for their lives than what they saw before injury. These possibilities may be just as (or more) satisfying to the person with TBI than what was "in store" for them prior to injury.

**Other Resources:**

Brain Injury Association of America  
[www.biausa.org](http://www.biausa.org)  
800-444-6443

National Brain Injury Research Treatment and Training Foundation  
[www.nbirtt.org](http://www.nbirtt.org)  
434-220-4824

North American Brain Injury Society  
[www.nabis.org](http://www.nabis.org)  
703-960-6500

Centers for Disease Control and Prevention  
[www.cdc.gov](http://www.cdc.gov)  
800-311-3435