

Frazier Rehabilitation Institute



Patient and Family Brain Injury Resource Guide

What is a Brain Injury?

Source fact sheets and more information about brain injury available at <https://msktc.org/tbi/factsheets>.

Traumatic brain injury (TBI) refers to damage to the brain caused by an external physical force such as a car accident, a gunshot wound to the head, or a fall. A TBI is not caused by something internal such as a stroke or tumor, and does not include damage to the brain due to prolonged lack of oxygen (anoxic brain injuries). It is possible to have a TBI and never lose consciousness. For example, someone with a penetrating gunshot wound to the head may not lose consciousness.

Commonly accepted criteria established by the TBI Model Systems (TBIMS) to identify the presence and severity of TBI include:

Damage to brain tissue caused by an external force and at least one of the following:

- A documented loss of consciousness
- The person cannot recall the actual traumatic event (amnesia)
- The person has a skull fracture, post-traumatic seizure, or an abnormal brain scan due to the trauma

A TBI can range from mild to severe in effect. The TBI Model System program focuses on those with moderate to severe TBI that requires participation in rehabilitation. Much of the information provided below focuses on those with moderate-severe TBI. **For information on mild brain injury/concussion, visit <https://cdc.gov/traumaticbraininjury/concussion/index.html>.**

Types of Injuries

The brain is about 3-4 pounds of extremely delicate soft tissue floating in fluid within the skull. Under the skull there are three layers of membrane that cover and protect the brain. The brain tissue is soft and therefore can be compressed (squeezed), pulled, and stretched. When there is sudden speeding up and slowing down, such as in a car crash or fall, the brain can move around violently inside the skull, resulting in injury.

Closed versus open head injury

Closed means the skull and brain contents have not been penetrated (broken into or through), whereas open means the skull and other protective layers are penetrated and exposed to air. A common example of an open head injury is a gunshot wound to the head. A common closed head injury is one that occurs as the result of a motor vehicle crash.

In a closed head injury, damage occurs because of a blow to the person's head or having the head stop suddenly after moving at high speed. This causes the brain to move forward and back or from side to side, such that it collides with the bony skull around it. This jarring movement bruises brain tissue. When brain injury occurs at high speed, the brain rotates inside the skull. This type of rotational movement damages axons (part of the nerve cell), and blood vessels by stretching and tearing them. After a closed head injury, damage can occur in specific brain areas (localized injury) or throughout the brain (diffuse axonal injury).

Damage following open head injury tends to be localized and therefore damage tends to be limited to a specific area of the brain. However, such injuries can be as severe as closed head injuries, depending on the destructive path of the bullet or other invasive object within the brain.

Primary versus secondary injuries

Primary injuries occur at the time of injury and there is nothing that physicians can do to reverse those injuries. Instead, the goal of the treatment team in the hospital is to prevent any further, or secondary, injury to the brain. Below are some primary injuries.

- Skull fracture occurs when there is a breaking or denting of the skull. Pieces of bone pressing on the brain can cause injury, often referred to as a depressed skull fracture.
- Localized injury means that a particular area of the brain is injured. Injuries can involve bruising (contusions) or bleeding (hemorrhages) on the surface of or within any layer of the brain.
- Diffuse axonal Injury (DAI) involves damage throughout the brain and loss of consciousness. DAI is a “stretching” injury to the neurons (the cell bodies of the brain) and axons (fibers that allow for communication from one neuron to another neuron). Everything our brains do for us depends on neurons communicating. When the brain is injured, axons can be pulled, stretched, and torn. If there is too much injury to the axon, the neuron will not survive. In a DAI, this happens to neurons all over the brain. This type of damage is often difficult to detect with brain scans like computed tomography (CT scans).

Secondary injuries occur after the initial injury, usually within a few days. Secondary injury may be caused by oxygen not reaching the brain, which can be the result of continued low blood pressure or increased intracranial pressure (pressure inside the skull) from brain tissue swelling.

Common Problems

Increased intracranial pressure

The brain is like any other body tissue when it gets injured: it fills with fluid and swells. Because of the hard skull around it, however, the brain has nowhere to expand as it swells. This swelling increases pressure inside the head (intracranial pressure), which can cause further injury to the brain. Decreasing and controlling intracranial pressure is a major focus of medical treatment early after a TBI. If intracranial pressure remains high, it can prevent blood passage to tissue, which results in further brain injury.

Neurochemical problems that disrupt functioning

Our brains operate based on a delicate chemistry. Chemical substances in the brain called neurotransmitters are necessary for communication between neurons, the specialized cells within our central nervous system. When the brain is functioning normally, chemical signals are sent from neuron to neuron, and groups of neurons work together to perform functions.

TBI disturbs the delicate chemistry of the brain so that the neurons cannot function normally. This results in changes in thinking and behavior. It can take weeks and sometimes months for the brain to resolve the chemical imbalance that occurs with TBI. As the chemistry of the brain improves, so can the person’s ability to function. This is one reason that someone may make rapid progress in the first few weeks after an injury.

Natural plasticity (ability of change) of the brain

The brain is a dynamic organ that has a natural ability to adapt and change with time. Even after it has been injured, the brain changes by setting up new connections between neurons that carry the messages within our brains. We now know the brain can create new neurons in some parts of the brain, although the extent and purpose of this is still uncertain.

Plasticity of the brain occurs at every stage of development throughout the life cycle.

Plasticity is more likely to occur when there is stimulation of the neural system, meaning that the brain must be active to adapt. Changes do not occur without exposure to a stimulating environment that prompts the brain to work. These changes do not occur quickly. That is one of the reasons that recovery goes on for months and sometimes years following TBI.

How does Brain Injury Impact Individuals' Functioning?

A traumatic brain injury interferes with the way the brain normally works. When nerve cells in the brain are damaged, they can no longer send information to each other in the normal way. This causes changes in the person's behavior and abilities. The injury may cause different problems, depending upon which parts of the brain were damaged most.

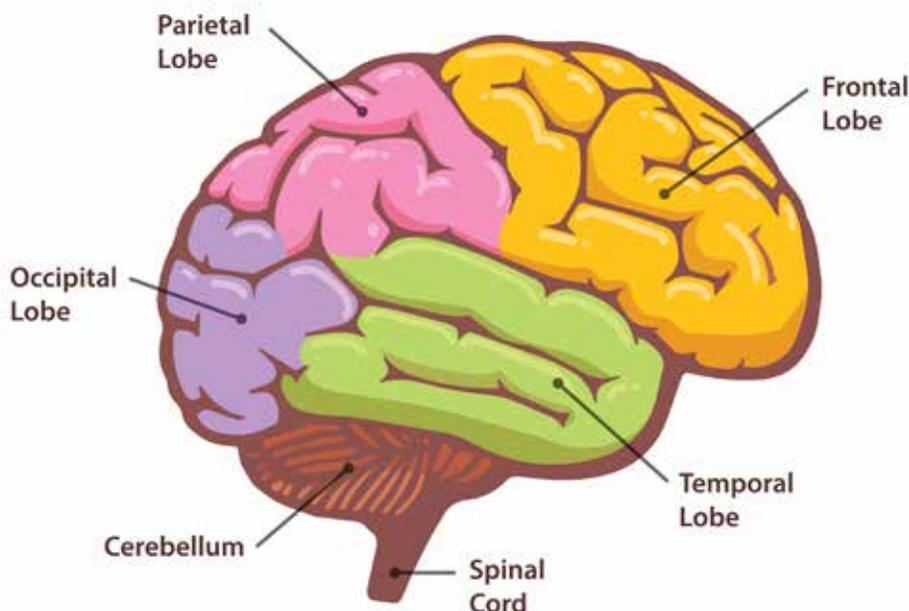
There are three general types of problems that can happen after TBI: physical, cognitive and emotional/behavioral problems. It is impossible to tell early on which specific problems a person will have after a TBI. Problems typically improve as the person recovers, but this may take weeks or months. With some severe injuries changes can take many years.

Structure and Function of the Brain

The brain is the control center for all human activity, including vital processes (breathing and moving) as well as thinking, judgment, and emotional reactions. Understanding how different parts of the brain work helps us understand how injury affects a person's abilities and behaviors.

Left vs. Right Brain

- The brain is divided into two halves (hemispheres). The left half controls movement and sensation in the right side of the body, and the right half controls movement and sensation in the left side. Thus, damage to the right side of the brain may cause movement problems or weakness on the body's left side.
- For most people, the left half of the brain is responsible for verbal and logical functions including language (listening, reading, speaking, and writing), thought and memory involving words.
- The right half is responsible for nonverbal and intuitive functions such as putting bits of information together to make up an entire picture, recognizing oral and visual patterns and designs (music and art), and expressing and understanding emotions.



Brain Areas and Associated Functions

The brain is made up of six parts that can be injured. The effect of a brain injury is partially determined by the location of the injury. Sometimes only a single area is affected, but in most cases of TBI multiple areas have been injured. When all areas of the brain are affected, the injury can be very severe.

Brain Stem

- Breathing
- Heart Rate
- Swallowing
- Reflexes for seeing and hearing
- Controls sweating, blood pressure, digestion, temperature
- Affects level of alertness
- Ability to sleep
- Sense of balance

Cerebellum

- Coordination of voluntary movement
- Balance and equilibrium
- Some memory for reflex motor acts

Frontal Lobe

- How we know what we are doing within our environment
- How we initiate activity in response to our environment
- Judgments we make about what occurs in our daily activities
- Controls our emotional response
- Controls our expressive language
- Assigns meaning to the words we choose
- Involves word associations
- Memory for habits and motor activities
- Flexibility of thought, planning and organizing
- Understanding abstract concepts
- Reasoning and problem solving

Parietal Lobe

- Visual attention
- Touch perception
- Goal directed voluntary movements
- Manipulation of objects
- Integration of different senses

Occipital Lobe

- Vision

Temporal Lobe

- Hearing ability
- Memory acquisition
- Some visual perceptions such as face recognition and object identification
- Categorization of objects
- Understanding or processing verbal information
- Emotion

What Problems are Associated with Moderate to Severe Brain Injury?

Physical Problems

Most people with TBI are able to walk and use their hands within 6-12 months after injury. In most cases, the physical difficulties do not prevent a return to independent living, including work and driving.

In the long term the TBI may reduce coordination or produce weakness and problems with balance. For example, a person with TBI may have difficulty playing sports as well as they did before the injury. They also may not be able to maintain activity for very long due to fatigue.

Cognitive (Thinking) Problems

- Individuals with a moderate-to-severe brain injury often have problems in basic cognitive (thinking) skills such as paying attention, concentrating, and remembering new information and events.
- They may think slowly, speak slowly and solve problems slowly.
- They may become confused easily when normal routines are changed or when things become too noisy or hectic around them.
- They may stick to a task too long, being unable to switch to different task when having difficulties.
- On the other hand, they may jump at the first solution they see without thinking it through.
- They may have speech and language problems, such as trouble finding the right word or understanding others.
- After brain injury, a person may have trouble with all the complex cognitive activities necessary to be independent and competent in our complex world. The brain processes large amounts of complex information all the time that allows us to function independently in our daily lives. This activity is called executive function because it means being the executive or being in charge of one's own life.

Communication Problems

Thinking difficulties can make it harder to express your thoughts and understand what others are trying to say. Examples of cognitive communication problems include:

- Difficulty thinking of the right word
- Trouble starting or following conversations or understanding what others say
- Rambling or getting off topic easily
- Difficulty expressing thoughts in an organized manner
- Trouble expressing your thoughts and feelings through facial expressions, tone of voice, and body language (nonverbal communication)
- Having problems reading others' nonverbal communication and social cues that indicate others' feelings, thoughts, expectations, or intentions
- Misunderstanding jokes or sarcasm

Though relatively rare, individuals may experience a specific language disorder called aphasia. Aphasia is a language disorder that can affect your ability to understand and use language. This can involve speaking, reading, writing, and listening abilities. A speech language pathologist can evaluate you for aphasia.

Emotional/Behavioral Problems

Behavioral and emotional difficulties are common and can be the result of several causes:

- First, the changes can come directly from damage to brain tissue. This is especially true for injuries to the frontal lobe, which controls emotion and behavior.
- Second, cognitive problems may lead to emotional changes or make them worse. For example, a person who cannot pay attention well enough to follow a conversation may become very frustrated and upset in those situations.
- Third, it is understandable for people with TBI to have strong emotional reactions to the major life changes that are caused by the injury. For example, loss of job and income, changes in family roles, and needing supervision for the first time in one's adult life can cause frustration and depression.

Brain injury can bring on disturbing new behaviors or change a person's personality. This is very distressing to both the person with the TBI and the family. These behaviors may include:

- Restlessness
- Acting more dependent on others
- Emotional or mood swings
- Lack of motivation
- Irritability
- Aggression
- Lethargy
- Acting inappropriately in different situations
- Lack of self-awareness. Injured individuals may be unaware that they have changed or have problems. This can be due to the brain damage itself or to a denial of what's really going on in order to avoid fully facing the seriousness of their condition.

Fortunately, with rehabilitation training, therapy and other supports, the person can learn to manage these emotional and behavioral problems.

Interpersonal Problems

Social skills are the skills people use to communicate and interact with others. Social skills include what you say, as well as your body language, eye contact, facial expressions, tone of voice, and other actions. Cognitive skills (for example: staying focused, memory) and emotions (for example: anxiety, anger, sadness) also play a part in social skills.

After a traumatic brain injury (TBI), people may have problems with social skills. These problems can differ from person to person and can be harder to manage when feeling strong emotions, such as anger or excitement. Common examples are:

- Feeling out of place and uncomfortable around other people
- Interrupting conversations
- Losing focus during a conversation
- Forgetting what someone has said
- Misunderstanding the words, facial expressions, tone of voice, or actions of others
- Difficulty getting along with others
- Talking too little or too much
- Having trouble expressing thoughts and feelings
- Not showing interest in what others have to say
- Not knowing how to start or maintain a conversation

How is Brain Injury Recovery Measured?

There are multiple assessment tools used to measure severity of injury and the recovery of a brain injury survivor. The tools used may depend on the treatment setting. In acute care, the **Glascow Coma Scale** is used to initially assess brain injury severity, with lower scores reflecting more severe injury. After the initial evaluation, the primary therapist will determine what tool will provide the most information to use accordingly. The **Rancho Los Amigos (RLA) Scale-Revised** is consistently used by the SLP team to measure cognitive recovery after brain injury. The **Disability Rating Scale (DRS)** is used consistently by the OT team. It tracks functional recovery from coma to community. A maximum score of 29 indicates an extremely vegetative state while a score of 0 indicates no disability.

The **Coma Recovery Scale-Revised (CRS-R)** is consistently used with the severe brain injury and/or Emerge Program population. It is used to assist with diagnosing, assessing recovery potential, and treatment planning for an individual with disorders of consciousness. Typically, 2 members of the rehab team (OT, PT, or SLP) will administer the CRS-R together every week and monitor progress until the individual has emerged into a functional state of awareness. At that point the DRS and RLA will be used alone. The CRS-R has a scale of 0-23 with 23 being the highest function measured. However, the number alone does not indicate emergence into functional awareness. The team is looking for a survivor's ability to consistently perform functional object use and/or demonstrate the ability to communicate.

These assessments, and possibly more, will be administered at least weekly discussed in team rounds to assist with continued treatment planning.

Rancho Los Amigos Scale-Revised

Level	Characteristics	Family Strategies
Level I No Response: Total Assistance	<ul style="list-style-type: none"> • No response to external stimuli 	<ul style="list-style-type: none"> • Use calm, reassuring tones, and in a normal tone of voice. • Tell the person what you are going to do before you do it. For example, "I'm going to move your leg."
Level II Generalized Response: Total Assistance	<ul style="list-style-type: none"> • Responds inconsistently and non-purposefully to external stimuli • Responses are often the same regardless of the stimulus 	<ul style="list-style-type: none"> • Tell the person who you are, where they are, why they are in the hospital, and what day it is. • Be concrete. • Gentle massage or physical touch increases the person's tactile awareness and provides sensory stimulation.
Level III Localized Response: Total Assistance	<ul style="list-style-type: none"> • Responds inconsistently and specifically to external stimuli • Responses are directly related to the stimulus, for example, patient withdraws or vocalizes to painful stimuli • Responds more to familiar people (friends and family) versus strangers 	<ul style="list-style-type: none"> • Focus on things familiar to patient (eg. family activities, music, interests). • Keep a notebook for family and visitors to sign. Instruct them to log in any noticeable responses to stimuli or events of the day. • Keep the room calm and quiet. • Monitor for over-stimulation • Maintain rest periods • Always assume the person with brain injury can understand what is being said. • Give one direction at a time and allow plenty of time for the response.

Rancho Los Amigos Scale-Revised

Level	Characteristics	Family Strategies
<p>Level IV</p> <p>Confused/Agitated:</p> <p>Maximal Assistance</p>	<ul style="list-style-type: none"> • The individual is in a hyperactive state with bizarre and non-purposeful behavior • Demonstrates agitated behavior that originates more from internal confusion than the external environment • Absent short-term memory • At this level, patients are often not able to cooperate. They are not aware of how they are behaving. 	<ul style="list-style-type: none"> • Tell the person where they are and reassure them that they are safe. • Remember that agitation is normal and part of getting better. • Bring in family pictures and other personal items. These may make the person feel more comfortable as well as stimulate memory. • Allow the person as much movement as is safely possible; Take person for rides in a wheel chair, if permitted. • Do not force the person into activities; listen to them and follow their lead, as is safely possible. • Provide frequent rest breaks to minimize episodes of increased restlessness and agitation. • Keep the room quiet and calm; If agitated, minimize external stimuli (e.g. TV/radio) and limit visitors. • If the patient is not talking, use other ways of communication such as head movements or finger tapping to show “yes” or “no”. The Speech Language Pathologist and/ or Occupational Therapist will be able to help to direct you with this.

Rancho Los Amigos Scale-Revised

Level	Characteristics	Family Strategies
<p>Level V Confused, Inappropriate Non-Agitated: Maximal Assistance</p>	<ul style="list-style-type: none"> • Shows increase in consistency with following and responding to simple commands • Responses are non-purposeful and random to more complex commands • Behavior and verbalization is often inappropriate, and individual appears confused and often confabulates • If action or tasks is demonstrated individual can perform but does not initiate tasks on own • Memory is severely impaired and learning new information is difficult • Different from level IV in that individual does not demonstrate agitation to internal stimuli. However, they can show agitation to unpleasant external stimuli. 	<ul style="list-style-type: none"> • Avoid the tendency to reward or play into inappropriate behavior. • Use redirection and distraction to stop inappropriate behavior. Reasoning at this stage may not be successful, but redirection is often easy and effective. • Do not assume that the person will remember what you tell them. They will require frequent repetition. • Keep comments and questions short and simple. • Remind the person of day, date, name and location of the hospital as well as why they are in the hospital. • Help the person get organized for tasks and activities. • Bring in familiar pictures and personal objects from home. • Limit visitors to 2-3 at a time. • Give patient frequent rest periods.
<p>Level VI Confused, Appropriate: Moderate Assistance</p>	<ul style="list-style-type: none"> • Able to follow simple commands consistently • Able to retain learning for familiar tasks they performed pre-injury (brushing teeth, washing face) however unable to retain learning for new tasks • Demonstrates increased awareness of self, situation, and environment but unaware of specific impairments and safety concerns • Responses may be incorrect secondary to memory impairments but appropriate to the situation 	<ul style="list-style-type: none"> • Expect the person to be unaware of their deficits and the need for increased supervision and rehabilitation. They may insist nothing is wrong with them and that they can go home and resume their usual activities. • Realize that redirection is not effective and arguments can be frequent and prolonged. • Encourage the person to participate in and continue to stay in rehabilitation services. • Understand that the person may react to their injury in a non-emotional manner and may appear not to care that they are injured. Family should know that this behavior is related to their stage of recovery. • Realize frequent repetition may be necessary. • Discuss and journal activities that have happened during the day, to help the person improve his/her memory. • Help with starting and continuing activities.

Rancho Los Amigos Scale-Revised

Level	Characteristics	Family Strategies
<p>Level VII</p> <p>Automatic, Appropriate: Minimal Assistance for Daily Living Skills</p>	<ul style="list-style-type: none"> • Oriented in familiar settings • Able to perform daily routine automatically with minimal to absent confusion • Demonstrates carry over for new tasks and learning in addition to familiar tasks • Superficially aware of one's diagnosis but unaware of specific impairments • Continues to demonstrate lack of insight, decreased judgment and safety awareness • Beginning to show interest in social and recreational activities in structured settings • Requires at least minimal supervision for learning and safety purposes. 	<ul style="list-style-type: none"> • Treat the person in the same way as they did before the brain injury. For example, provide guidance and assistance in decision-making but respect the individual's opinions. • Speak with normal speech patterns and vocabulary. Simple words or phrases are no longer needed. Be concrete and avoid teasing or humor. • Talk through and help develop strategies with problems about the person's thinking skills, problem solving or memory challenges without criticizing. Reassure the individual that problems may persist and are "normal within the scope" of the brain injury. • Encourage the person to remain in therapy, to improve their cognitive skills. • Check with the physician regarding any restrictions or precautions. • Talk with the person about feelings and offer outside support such as counseling and/or support groups.
<p>Level VIII</p> <p>Purposeful, Appropriate: Stand By Assistance</p>	<ul style="list-style-type: none"> • Consistently oriented to person, place and time • Independently carries out familiar tasks in a non-distracting environment • Beginning to show awareness of specific impairments and how they interfere with tasks. • Able to use assistive memory devices to recall daily schedule • Acknowledges other's emotional states and requires only minimal assistance to respond appropriately • Demonstrates improvement of memory and ability to consolidate the past and future events • Often depressed, irritable and with low frustration threshold 	

Rancho Los Amigos Scale-Revised

Level	Characteristics	Family Strategies
<p>Level IX: Purposeful, Appropriate: Stand By Assistance on Request</p>	<ul style="list-style-type: none"> • Able to shift between different tasks and complete them independently • Aware of and acknowledges impairments when they interfere with tasks and able to use compensatory strategies to cope • Unable to independently anticipate obstacles that may arise secondary to impairment • With assistance able to think about consequences of actions and decisions • Acknowledges the emotional needs of others with stand by-assistance. 	<ul style="list-style-type: none"> • Treat the person in the same way as they did before the brain injury. For example, provide guidance and assistance in decision-making but respect the individual's opinions. • Speak with normal speech patterns and vocabulary. Simple words or phrases are no longer needed. Be concrete and avoid teasing or humor. • Talk through and help develop strategies with problems about the person's thinking skills, problem solving or memory challenges without criticizing. Reassure the individual that problems may persist and are "normal within the scope" of the brain injury. • Encourage the person to remain in therapy, to improve their cognitive skills. • Check with the physician regarding any restrictions on driving, sports, drinking. • Talk with the person about feelings and offer outside support such as counseling and/or support groups.
<p>Level X: Purposeful, Appropriate: Modified Independent</p>	<ul style="list-style-type: none"> • Able to multitask in many different environments with extra time or devices to assist • Able to create own methods and tools for memory retention • Independently anticipates obstacles that may occur as a result of impairments and take corrective actions • Able to independently make decisions and act appropriately but may require more time or compensatory strategies • Demonstrate intermittent periods of depression and low frustration threshold when under stress • Able to appropriately interact with others in social situations 	

Scale can be found at:
www.neuroskills.com/education-and-resources/rancho-los-amigos-revised

Caring for an Individual with a Brain Injury

- Family members and caregivers of individuals that have suffered a brain injury often experience life changes. While everyone's situation is different, these may include relationship changes, role changes, having less time for oneself, financial difficulties, problems with communication, and limited support from others.
- Family members and caregivers have commonly reported feeling sad, anxious, angry, frustrated, or guilty. While these emotions are a normal response, they can become overwhelming and difficult to manage. A little stress is to be expected; however, significant stress that lasts for a long time can negatively impact our mind and body.

Reducing Stress and Managing Emotions

- If you do not take the time to care for yourself, it can be difficult to be able to care for others. Imagine being on an airplane and being told that you need to put your oxygen mask on before helping others around you. The same is true for caregiving.
- Below are strategies for reducing stress and managing difficult emotions. These are strategies that work for many people; however, not all may work for you. Practicing these strategies often can make them easier to use when stressed.
- Self-Care
 - Exercise.
 - Eat healthy.
 - Keep a regular schedule.
 - Take time for yourself to do activities that you enjoy and those that provide you a sense of accomplishment.
- Relaxation
 - Deep breathing.
 - Present moment focus.
 - Imagery that taps into the five senses.
- Problem Solving
 - Identify the problem.
 - Brainstorm solutions.
 - Evaluate alternatives.
 - Choose the solution that seems to be best for the situation.
 - Try the solution and if it does not work then try the next best option.
- Social Support
 - Discuss the situation with your support system and, early on, determine who can assist and in what ways.
 - Support comes in many different forms. Emotional support is someone you can talk with that provides hope and a listening ear. Instrumental support provides us with aid and services, such as transportation. Informational support provides us with advice and suggestions. Utilize the various types of support that you have and don't be afraid to reach out to your support system when needs arise.

Ways Caregivers Can Help with the Individual with a Brain Injury

- Provide structure and normalcy to daily life
 - Establish and maintain a daily routine.
 - Include the individual in family activities and conversation.
 - Communicate with the individual as you would have prior to brain injury.
- Provide support in a respectful way
 - Focus on the individual's strengths and gains since their injury.
 - Avoid comparing speech, language, or physical abilities prior to injury with how they are now.
 - Treat the individual as an adult.
 - Respect the individual's likes and dislikes (e.g., food, attire, entertainment, music).
 - Avoid making the person feel guilty for mistakes and accidents.
 - Explain an activity simply before beginning. As you complete the activity, review the steps in more detail for the individual.
- Avoid over-stimulation
 - Limit the number of visitors.
 - Have only one person speak at a time.
 - Use short sentences and simple words.
 - Present only one thought or command at a time and allow ample time for a response.
 - Use a calm, soft voice when speaking with the individual.
 - Allow quiet time if the individual begins to exhibit agitation

Education for Caregivers

Brain Injury Caregiver Education Group @ Frazier Rehab Institute

10:30-11:30 a.m. • Mondays and Fridays

7th Floor Conference Room

Contact for more information: (502) 582-7600

Brain Injury Survivor Support Group @ Frazier NeuroRehab

5:30-6:30 p.m. • Third Wednesday of each Month

Contact for more information: (502) 429-8640

Family and Caregiver Support Group @ Frazier NeuroRehab

4:30-6 p.m. • Quarterly (Feb, May, Aug, Nov)

Contact for more information: (502) 429-8640

At UofL Health – Frazier Rehab Institute, the brain injury team is dedicated to assisting individuals in developing the skills and confidence needed to rebuild their lives. The Brain Injury Program offers many resources that focus on education and advocacy.

Family members who are not able to attend the classes in person are encouraged to learn about brain injury by viewing these materials and attending support groups.

Continuum of Care After Brain Injury

While recovery from a brain injury is a long-term process, it is our goal to discharge most of our patients to their home. This usually occurs after only a couple weeks of inpatient rehab. Therefore, outpatient or home-based services will often be needed to continue the recovery process. To ensure families are prepared, discharge planning will begin very early in the rehabilitation stay and discussed in the weekly physician rounds meetings. There are times that additional family meetings are necessary to address specific concerns. The rehabilitation team will make recommendations for outpatient care/therapy to support each patient's recovery. We encourage our patients and families to participate in this treatment planning process to ensure your needs and goals are addressed. If there are specific concerns, these can be routed to the case manager.

Outpatient brain injury rehabilitation recommendations may include:

- Individual outpatient services designed to address specific therapeutic interventions at a Frazier or non-Frazier site depending on patient-specific needs.
- A comprehensive community re-entry program, such as the Frazier NeuroRehab Program
- Additional specialist referrals, such as a Neuropsychologist or Neuro-optometrist for vision therapy.
- Referrals for grants, programs, or studies that may provide resources or benefits (e.g., RETAIN, Vocational Rehabilitation)

Return to School/Work

The rehabilitation team will discuss school and/or work return as part of the treatment plan, offering recommendations upon discharge. The key to successful reintegration into work or school settings is communication and education about brain injury for all parties involved. The case manager serves as a liaison between the patient/family and the team to ensure questions and concerns are addressed.

Additionally, the team is aware of legislation that may be pertinent to work return with a brain injury.

- The Americans with Disability Act (ADA)
Prohibits discrimination against individuals with disabilities in all areas of public life including schools, jobs, transportation, and access to all aspects of life in the public sphere. It shapes resources and policies for your return to work, whether that is your previous employment or new employment.
- The Rehabilitation Act: Section 504
Provides a list of accommodations to help the child succeed in the school setting. While private schools are not subject to Federal Law requirements for special education, it is common for the rehabilitation team to assist with private school re-entry or early intervention services for children aged birth to 3 years.

Additional community and return to work/school resources can be found in our comprehensive community resource guide: uoflhealthnetwork.org/frazier-rehab-institute.

Activity Precautions Following a Brain Injury

Having a brain injury raises the risk for potential complications – including increased risk of a subsequent brain injury. In order to maximize recovery, the following precautions are strongly encouraged. Please note that this is a general list of recommendations for a person with a brain injury. Consult with your physician for specific questions/concerns.

The following precautions are strongly recommended for all persons who have sustained a brain injury:

- Always wear a seat belt. Children should be placed in a child safety seat.
- Adults and adolescents who plan to drive must complete the driver's evaluation and possibly the driver's course for individuals who have sustained a brain injury.
- Always wear a helmet when biking, roller-skating, roller blading or skate boarding.
- Avoid use of tobacco, alcohol, or illicit drugs.
- Use equipment to reduce risk of falls (as recommended by your therapy team). This may include use of rails, grab bars, non-slip mats, rubber-soled shoes/ sticky socks, or taking steps to improve lighting/reduce trip hazards.
- Utilize modified diet/swallowing compensations as directed by your Speech Therapist (if applicable) to reduce risk of pneumonia.
- Be aware that your brain may be more sensitive to overstimulation (such as being in a large crowd of people/noisy environment) and require a quiet and calm space for breaks.
- Be alert for signs of emotional changes, such as depression, anxiety, and anger management problems, which are more common after a brain injury. Consult with your physician if you are experiencing ongoing emotional problems.
 - **In case of a mental health emergency, 24/7 assistance is available:
National Suicide Prevention Lifeline: 800-273-TALK (8255)**

The following precautions are recommended during the first two years for everyone who has sustained a brain injury, with exceptions to be approved by your physician:

- Do not drive or ride mopeds, 4-wheelers, motorcycles, jet skis, or any other open vehicle.
- No diving into water.
- No water/snow skiing or "tubing."
- No contact sports including football, basketball, soccer, volleyball, wrestling, hockey, boxing, horseback riding, etc.
- No hunting, firing range, guns, heavy machinery, or power tools.
- No amusement park rides.

Some medications (even ones available over-the-counter) can be harmful for those with a brain injury. Speak with your rehab physician before taking the following medications:

- Medications with alcohol content (such as some cough medicine and laxatives)
- Medications with pseudoephedrine listed as an ingredient
- Medications with codeine
- Medications that may cause a sedative-type effect
- Antidepressant medications (unless prescribed by your rehab doctor)
- Allergy medications
 - If you or your primary care physician have any questions about medication issues, please contact your rehab doctor. **Remember: never stop taking any medications that were prescribed by your rehab doctor – contact your doctor first!**

FRAZIER REHAB INSTITUTE Brain Injury Education



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To access education about brain injury and recovery, visit our webpage:

◀ UofLHealthNetwork.org/Brain-Injury-Program

Brain Injury Program
Maintaining Wellness After Brain Injury
Who We Serve
Program Goals and Benefits
Common Changes
EMERGE Program
Inpatient Rehab-Brain Injury
Outpatient Rehab-Brain Injury
Patient Testimonials
Facility Features
Interdisciplinary Team of Experts
Education

Education

At UofL Health - Frazier Rehab Institute, the brain injury team is dedicated to assisting individuals in developing the skills and confidence needed to rebuild their lives. The Brain Injury Program offers many resources that focus on education and advocacy.

The rehab team will provide family members with literature, education and support as the patient goes through rehab. We will conduct team and family meetings as needed to ensure the family and the rehab team goals are the same, and we will provide ongoing education throughout the rehab stay.

Support resources include a weekly brain injury education and support group for families and patients, and vocational counseling through the Kentucky Vocational Rehabilitation Department. In addition, a representative from the Brain Injury Association of Kentucky (BIAK) visits Frazier weekly and is available to meet patients and families. The BIAK is Kentucky's chartered state affiliate of the Brain Injury Association of America. The BIAK's mission is to serve Kentucky citizens whose lives have been affected by brain injury through advocacy, education, prevention, research, service and support.

Additional Information

- Mild Traumatic Brain Injury/Concussion

Acquired Brain Injury Education

- Brain Basics - Neuroanatomy & Neuropsychology
- Case Management & Discharge Planning
- Cognition & Communication
- Rehab Nursing: Pain Management & Other Complications
- Physical & Occupational Therapy: Safety & Complication Prevention

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To view the Brain Injury Education, click "Education" on the left-side navigation.

Family members who are not able to attend the classes in person are encouraged to learn about brain injury by viewing these materials and attending support groups.



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UofLHealthNetwork.org/brain-injury-program

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