BRAIN INJURY
EDUCATION
NOTEBOOK

GREENVILLE HEALTH SYSTEM
Roger C. Peace
Rehabilitation Hospital
Brain Injury Education Notebook
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The Brain Injury Rehabilitation Program at Roger C. Peace Rehabilitation Hospital is an important part of the continuum of care provided to individuals with brain injury by the Greenville Health System. Rehabilitation is initiated as soon as possible by a specialized medical team including physicians, nurses, therapists, neuropsychologists, and case managers experienced in assessing and treating brain injury. Comprehensive evaluations are used to develop an individualized treatment program designed to meet the specific needs of the patient. Specialized intervention is focused on improving functional status to meet the goals of each patient. Care is carefully coordinated during the patient’s stay. Each member of the treatment team provides education to help patient and family understand the new needs of the survivor. Case management keeps patient and family informed of progress toward goals and coordinates discharge planning, including arranging for any necessary equipment and follow-up treatment.

The purpose of this notebook is to supplement staff teaching of patients and their family and friends and provide them with an ongoing reference. In this notebook you will learn about all aspects of living with brain injury.

We have provided a page for “Questions I Would Like to Ask” near the front of the notebook. Also, behind each therapy section, you will find pages for family training notes. You will be given a lot of information, so we encourage you to make notes during family/caregiver training sessions. Your treatment team will be adding to and reviewing information in this notebook throughout your stay, so we encourage you to return the book to the Roger C. Peace backpack between uses.

Again, thank you for choosing Roger C. Peace for your rehabilitation needs.
QUESTIONS I WOULD LIKE TO ASK

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What is inpatient rehabilitation?

Inpatient rehabilitation is designed to help you improve function after a moderate to severe traumatic brain injury (TBI) and is usually provided by a team of people including physicians, nurses and other specialized therapists and medical professionals.

What are the common problems addressed by inpatient rehabilitation?

- Thinking problems – difficulty with memory, language, concentration, judgment and problem solving.
- Physical problems – loss of strength, coordination, movement and swallowing.
- Sensory problems – changes in sense of smell, vision, hearing and tactile touch.
- Emotional problems – mood changes, impulsiveness and irritability.

Am I eligible to receive inpatient rehabilitation?

You will receive inpatient rehabilitation if:

- You have a new TBI that prevents you from returning home to family care.
- Your medical condition is stable enough to allow participation in therapies. For people relying on Medicare for funding, this means being able to participate in at least 3 hours of therapy per day. (Specialized rehabilitation in a nursing facility is an option for those who cannot participate in 3 hours of rehabilitation per day.)
- You are able to make progress in therapies.
- You have a social support system that will allow you to return home or to another community care setting after reasonable improvement of function.
- You have insurance or other ways to cover the cost of treatment.

How does inpatient rehabilitation work?

Your therapies will be designed to address your specific needs. You will receive at least 3 hours of different types of therapy throughout the day with breaks in between, 5-7 days a week.
You will be under the care of a physician who will see you at least 3 times a week.

Most TBI rehabilitation inpatients participate in:
- Physical therapy
- Occupational therapy
- Speech therapy

Each of these therapies may be provided in an individual or group format.

**Rehabilitation team**

Rehabilitation care usually involves a team of highly trained practitioners, called your “multidisciplinary team.” This team works together every day and shares information about your treatment and recovery. Once a week all the team members meet formally to discuss your progress and discharge plan in a team conference.

Members of your multidisciplinary team are:

**Physician:** This may be a physiatrist (physician whose specialty is rehabilitation medicine), neurologist or other specialist familiar with TBI rehabilitation. He/she is in charge of your overall treatment and directs your rehabilitation program. The physician will:
- Evaluate your physical abilities, along with your thinking and behavior.
- Prescribe medication as necessary to manage mood, sleep, pain and nutrition.
- Prescribe tailored therapy orders for physical therapy, occupational therapy and speech therapy.

**Rehabilitation Nurse:** The rehabilitation nurse works very closely with the physician in managing medical problems and preventing complications. The nurse will:
- Assess a variety of issues, including self-care, bowel and bladder function, sexuality, nutrition and mobility.
- Reinforce the treatments of the other team members.
- Provide you and your family with education about your brain injury and medications.

**Psychologist/Neuropsychologist:** He/she will assess and treat problems you may have with thinking, memory, mood and behavior. The psychologist/neuropsychologist may also provide counseling and education to your family members, thus ensuring that they have an understanding of the treatment plan and possible outcomes.

**Physical therapist:** The physical therapist (PT) will help you improve your physical function and mobility. The PT’s role is to teach you how to be as physically independent and as safe as possible within your environment. This is accomplished through therapeutic exercises and re-education of your muscles and nerves, with the goal of restoring normal function. Specific goals to be accomplished in the physical therapy gym include strengthening your muscles and improving endurance, walking and balance.

**Occupational therapist:** Occupational therapists (OT) provide training in activities of daily living to help you become more independent. These activities typically include eating, bathing, grooming, dressing, and transferring to and from your bed, wheelchair, toilet, tub and shower. The OT will work with you on underlying skills, such as strength, balance and trunk control. Depending on the center, occupational therapists may also:
- Assess your thinking skills, such as orientation, memory, attention, concentration, calculation, problem-solving, reasoning and judgment.
- Assess your visual problems.
- Help you manage more complex activities such as meal preparation/cooking, money management, and getting involved in community activities.
- Recommend and order appropriate equipment you may need before returning home.

**Speech-language pathology therapist:** The speech-language pathology therapist is responsible for the treatment of speech, swallow and communication problems. She/he will:
- Help you with communication problems such as difficulty understanding what others say or expressing yourself clearly.
- Teach you exercises and techniques to improve your ability to speak and express yourself, including exercises to strengthen the muscles used in speech/swallowing, and speech drills to improve clarity.

- Assess your language skills, such as orientation, memory, attention, concentration, calculation, problem-solving, reasoning and judgment.

- Provide a communication device if you have a breathing tube (tracheostomy).

- Evaluate your swallowing abilities if you have difficulty swallowing (dysphagia).

- If needed, make recommendations about the types and consistencies of foods and drinks that you can safely consume.

**Recreation therapist:** The role of the recreation therapist is to provide recreational resources and opportunities in order to improve your health and well-being and get you reconnected in the community. Returning to recreation and/or finding new recreational activities is an important part of recovery. This may include outings or in-hospital social and group activities.

**Social worker:** The social worker will provide you and your family with information about community resources and help plan for your hospital discharge and return to the community. She/he will:

- Help determine your eligibility for benefits, such as Medicaid and Social Security.

- Make referral to community resources for you and your family.

- Provide ongoing supportive counseling to help you adjust to your new situation.

**Nutritionist/Dietitian:** The dietitian evaluates your nutritional status and makes recommendations about proper nutrition and diet. Patients are frequently malnourished and underweight after a hospital stay. Individualized attention to diet and caloric intake assists in recovery. The dietitian will also educate you regarding menu selection, proper food consistencies, diet changes, etc., as it fits your needs.

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**How can your family members offer support during inpatient rehabilitation?**

Family members can:

- Get to know the team members caring for you.

- Ask when and how they can participate in therapy sessions.

- Ask about improvements that they can expect to see during rehabilitation.

- Ask questions about the rehabilitation therapies.

- Ask about and discuss the discharge process early on in your stay, since the time in inpatient rehabilitation can be short.

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**What happens after inpatient rehabilitation?**

Leaving inpatient rehabilitation can be an anxiety-producing transition. Many questions can arise at the time of discharge, such as:

- How will I be able to continue to progress after I leave the hospital?

- Who will take care of me when I go home?

- What if I need more help than my family can provide for me?

To ease this transition, social workers make sure that you have what you need to safely continue recovery after you leave the hospital.

As the date of your discharge approaches, depending on your particular setting, the social worker, care manager, and/or discharge planner will meet more regularly with you and your family to form a discharge plan. They can:

- Provide emotional support.

- Help you get the care you need. This includes where you will get the services you need, who will provide them, and maximizing use of insurance benefits.
- Identify community resources (e.g., finances, home care, transportation, and community service organizations) that can help you function well in your community. This often includes government services such as SSI (Supplemental Security Income), SSDI (Social Security Disability Insurance), Medicaid, Medicare, and other disability benefits.

**Discharge Plans**

Every discharge plan is different and reflects a patient’s unique personal and social situation. Recovery from a brain injury takes months and even years, so after discharge most people will require ongoing therapy. Discharge plans fall roughly into one of four categories:

- **Discharge Home, with Referral for Home-Based Rehabilitation Services**: This discharge plan is appropriate for those people who are well enough to be at home, but who are not well enough to travel for therapy. In these cases, the social worker will make a referral to a nursing agency that will visit you at home, assess your needs, and provide needed services, which may include physical and occupational therapy and a home health attendant. However, family is almost always needed to provide some of the help that you will need at home.

- **Discharge Home, with Referral for Outpatient Services**: This discharge plan is appropriate for those people who are well enough to be at home and able to travel to an outpatient clinic for therapy. In this case, family members will provide all the help and supervision you need at home, and your rehabilitation therapies will be provided through an outpatient clinic that is convenient to you.

- **Discharge to a Residential Brain Injury Rehabilitation Program**: This discharge plan is appropriate for people who are well enough to live in the community but require a supervised and structured environment. This option is generally best for persons who do not need inpatient supervision by a nurse or physician but may benefit from continued therapy to transition back into the community. The availability of these programs varies based on insurance type and where you live.

- **Discharge to a Nursing Facility**: This discharge plan is appropriate for people who are not yet ready to return home and who would benefit from continuing their rehabilitation therapies in a structured environment with nursing care. The nursing facility can provide nursing care and ongoing rehabilitation therapy in specialized rehabilitation wings (sometimes called subacute rehabilitation), usually for up to three months. Length of stay varies based on medical need, degree of progress in that setting, and availability of rehabilitation benefit. If your team recommends a nursing facility that provides subacute rehabilitation, the social worker will help you find one that meets your individual needs.

**Disclaimer**

This information is not meant to replace the advice from a medical professional. You should consult your health care provider regarding specific medical concerns or treatment.

**Source**

Our health information content is based on research evidence whenever available and represents the consensus of expert opinion of the TBI Model System directors.

**Authorship**

The TBI and Inpatient Rehabilitation factsheet was developed by Brian D. Greenwald, MD, in collaboration with the University of Washington Model Systems Knowledge Translation Center.
Cognition refers to a person's thinking and memory skills. Cognitive skills include paying attention, being aware of one's surroundings, organizing, planning, following through on decisions, solving problems, judgement, reasoning, and awareness of problems. Memory skills include the ability to remember things before and after the brain injury. Because of the damage caused by a brain injury, some or all of these skills will be changed.

The Rancho Levels of Cognitive Functioning is an evaluation tool used by the rehabilitation team. The eight levels describe the patterns or stages of recovery typically seen after a brain injury. This helps the team understand and focus on the person's abilities and design an appropriate treatment program. Each person will progress at their own rate, depending on the severity of the brain damage, the location of the injury in the brain and length of time since the brain injury. Some individuals will pass through each of the eight levels, while others may progress to a certain level and fail to change to the next higher level.

It is important to remember that each person is an individual and there are many factors that need to be considered when assigning a level of cognition. There are a range of abilities within each of the levels and your family member may exhibit some or all of the behaviors listed below.

**COGNITIVE LEVEL I**

NO RESPONSE

A person at this level will:

- not respond to sounds, sights, touch or movement.

**COGNITIVE LEVEL II**

GENERALIZED RESPONSE

A person at this level will:

- begin to respond to sounds, sights, touch or movement;
- respond slowly, inconsistently, or after a delay;
- responds in the same way to what he hears, sees or feels. Responses may include chewing, sweating, breathing faster, moaning, moving, and/or increasing blood pressure.

**COGNITIVE LEVEL III**

LOCALIZED RESPONSE

A person at this level will:

- be awake on and off during the day;
- make more movements than before;
- react more specifically to what he sees, hears, or feels. For example, he may turn towards a sound, withdraw from pain, and attempt to watch a person move around the room;
- react slowly and inconsistently;
- begin to recognize family and friends;
- follow some simple directions such as "Look at me" or "squeeze my hand";
- begin to respond inconsistently to simple questions with "yes" and "no" head nods.

What family/friends can do at Cognitive Levels I, II, and III

- Explain to the individual what you are about to do. For example, "I'm going to move your leg."
- Talk in a normal tone of voice.
- Keep comments and questions short and simple. For example, instead of "Can you turn your head
towards me?", say, "Look at me".
• Tell the person who you are, where he is, why he is in the hospital, and what day it is.
• Limit the number of visitors to 2-3 people at a time.
• Keep the room calm and quiet.
• Bring in favorite belongings and pictures of family members and close friends.
• Allow the person extra time to respond, but don't expect responses to be correct. Sometimes the person may not respond at all.
• Give him rest periods. He will tire easily.
• Engage him in familiar activities, such as listening to his favorite music, talking about the family and friends, reading out loud to him, watching TV, combing his hair, putting on lotion, etc.
• He may understand parts of what you are saying. Therefore, be careful what you say in front of the individual.

What family/friends can do at Cognitive Level IV:
• Tell the person where he is and reassure him that he is safe.
• Bring in family pictures and personal items from home, to make him feel more comfortable.
• Allow him as much movement as is safe.
• Take him for rides in his wheelchair, with permission from nursing.
• Experiment to find familiar activities that are calming to him such as listening to music, eating, etc.
• Do not force him to do things. Instead, listen to what he wants to do and follow his lead, within safety limits.
• Since he often becomes distracted, restless, or agitated, you may need to give him breaks and change activities frequently.
• Keep the room quiet and calm. For example, turn off the TV and radio, don't talk too much and use a calm voice.
• Limit the number of visitors to 2-3 people at a time.

COGNITIVE LEVEL IV
CONFUSED AND AGITATED

A person at this level may:
• be very confused and frightened;
• not understand what he feels or what is happening around him;
• overreact to what he sees, hears, or feels by hitting, screaming, using abusive language, or thrashing about. This is because of the confusion;
• be restrained so he doesn't hurt himself;
• be highly focused on his basic needs; ie., eating, relieving pain, going back to bed, going to the bathroom, or going home;
• may not understand that people are trying to help him;
• not pay attention or be able to concentrate for a few seconds;
• have difficulty following directions;
• recognize family/friends some of the time;
• with help, be able to do simple routine activities such as feeding himself, dressing or talking.

COGNITIVE LEVEL V
CONFUSED AND INAPPROPRIATE

A person at this level may:
• be able to pay attention for only a few minutes;
• be confused and have difficulty making sense of things outside himself;
• not know the date, where he is or why he is in the hospital;
• not be able to start or complete everyday activities, such as brushing his teeth, even when physically able. He may need step-by-step instructions;
• become overloaded and restless when tired or when there are too many people around; have a very poor memory, he will remember past events from before the accident better than his daily routine or information he has been told since the injury;
• try to fill in gaps in memory by making things up; (confabulation)
• may get stuck on an idea or activity (perseveration) and need help switching to the next part of the activity;
• focus on basic needs such as eating, relieving pain, going back to bed, going to the bathroom, or going home.

What family/friends can do at Cognitive Level V.

• Repeat things as needed. Don't assume that he will remember what you tell him.
• Tell him the day, date, name and location of the hospital, and why he is in the hospital when you first arrive and before you leave.
• Keep comments and questions short and simple.
• Help him organize and get started on an activity.
• Bring in family pictures and personal items from home.
• Limit the number of visitors to 2-3 at a time.
• Give him frequent rest periods when he has problems paying attention.

COGNITIVE LEVEL VI
CONFUSED AND APPROPRIATE

A person at this level may:

• be somewhat confused because of memory and thinking problems, he will remember the main points from a conversation, but forget and confuse the details. For example, he may remember he had visitors in the morning, but forget what they talked about;
• follow a schedule with some assistance, but becomes confused by changes in the routine;
• know the month and year, unless there is a severe memory problem;
• pay attention for about 30 minutes, but has trouble concentrating when it is noisy or when the activity involves many steps. For example, at an intersection, he may be unable to step off the curb, watch for cars, watch the traffic light, walk, and talk at the same time;
• brush his teeth, get dressed, feed himself etc., with help;
• know when he needs to use the bathroom;
• do or say things too fast, without thinking first;
• know that he is hospitalized because of an injury, but will not understand all of the problems he is having;
• be more aware of physical problems than thinking problems;
• associate his problems with being in the hospital and think that he will be fine as soon as he goes home.

What family/friends can do at Cognitive Level VI:

• You will need to repeat things. Discuss things that have happened during the day to help the individual improve his memory.
• He may need help starting and continuing activities.
• Encourage the individual to participate in all therapies. He will not fully understand the extent of his problems and the benefits of therapy.

COGNITIVE LEVEL VII
AUTOMATIC AND APPROPRIATE

A person at this level may:

• follow a set schedule;
• be able to do routine self care without help, if physically able. For example, he can dress or feed himself independently; have problems in new situations and may become frustrated or act without thinking first;
• have problems planning, starting, and following through with activities;
• have trouble paying attention in distracting or stressful situations. For example, family gatherings, work, school, church, or sports events;
• not realize how his thinking and memory problems may affect future plans and goals. Therefore, he may expect to return to his previous lifestyle or work;
• continue to need supervision because of decreased safety awareness and judgment. He still does not fully understand the impact of his physical or thinking problems;
• think slower in stressful situations;
• be inflexible or rigid, and he may seem stubborn. However, his behaviors are related to his brain injury;
• be able to talk about doing something, but will have problems actually doing it.

COGNITIVE LEVEL VIII
PURPOSEFUL AND APPROPRIATE

A person at this level may:

• realize that he has a problem in his thinking and memory;
• begin to compensate for his problems;
• be more flexible and less rigid in his thinking. For example, he may be able to come up with several solutions to a problem;
• be ready for driving or job training evaluation;
• be able to learn new things at a slower rate;
• still become overloaded with difficult, stressful or emergency situations;
• show poor judgment in new situations and may require assistance;
• need some guidance to make decisions;
• have thinking problems that may not be noticeable to people who did not know the person before the injury.

What family/friends can do at Cognitive Levels VII/VIII

• Treat the person as an adult by providing guidance and assistance in decision making. His opinions should be respected.
• Talk with the individual as an adult. There is no need to try to use simple words or sentences.
• Be careful when joking or using slang, because the individual may misunderstand the meaning. Also, be careful about teasing him.
• Help the individual in familiar activities so he can see some of the problems he has in thinking, problem solving, and memory. Talk to him about these problems without criticizing. Reassure him that the problems are because of the brain injury.
• Strongly encourage the individual to continue with therapy to increase his thinking, memory and physical abilities. He may feel he is completely normal. However, he is still making progress and may possibly benefit from continued treatment.
• Be sure to check with the physician on the individual’s restrictions concerning, driving, working, and other activities. Do not just rely on him for information, since he may feel he is ready to go back to his previous lifestyle.
• Discourage him from drinking or using drugs, due to medical complications.
• Encourage him to use note taking as a way to help with his remaining memory problems.
• Encourage him to carry out his self-care as independently as possible.
• Discuss what kinds of situations make him angry and what he can do in these situations.
• Talk with him about his feelings.
• Learning to live with a brain injury can be difficult and it may take a long time for the individual and family to adjust. The social worker and/or psychologist will provide the family/friends with information regarding counseling, resources, and/or support organizations.

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Disclaimer: Information presented on this page is for specific health education purposes only. Persons should consult qualified health professionals regarding specific medical concerns or treatment. Each clinician caring for the patient is responsible for determining the most appropriate care.
What is a brain injury?

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

Causes of TBI

Statistics from Centers for Disease Control for 2002-2006 indicate that the leading cause of brain injury is falls (35%) followed by car crashes (17%) and being struck by an object (16%). Emergency room visits due to TBI caused by falls are increasing for both younger and older people. However, if you focus only on moderate to severe TBI (those injuries that require admission to a neurointensive care unit), car crashes are the most frequent cause of TBI, followed by gunshot wound, falls, and assault.

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 classic example of an open head injury
is a gunshot wound to the head. A classic 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, damages axons (part of the nerve cell), and tears blood vessels. 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.

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.

**Measuring the severity of TBI**

“Severity of injury” refers to the degree or extent of brain tissue damage. The degree of damage is estimated by measuring the duration of loss of consciousness, the depth of coma and level of amnesia (memory loss), and through brain scans.

The **Glasgow Coma Scale** (GCS) is used to measure the depth of coma. The GCS rates three aspects of functioning:

- Eye opening
- Movement
- Verbal response

Individuals in deep coma score very low on all these aspects of functioning, while those less severely injured or recovering from coma score higher.

- A GCS score of 3 indicates the deepest level of coma, describing a person who is totally unresponsive.
- A score of 9 or more indicates that the person is no longer in coma, but is not fully alert.
- The highest score (15) refers to a person who is fully conscious.

A person's first GCS score is often done at the roadside by the emergency response personnel. In many instances, moderately to severely injured people are intubated (a tube is placed down the throat and into the air passage into the lungs) at the scene of the injury to ensure the person gets enough oxygen. To do the intubation the person must be sedated (given medication that makes the person go to sleep). So, by the time...
the person arrives at the hospital he/she has already received sedating medications and has a breathing tube in place. Under these conditions it is impossible for a person to talk, so the doctors cannot assess the verbal part of the GCS. People in this situation often receive a “T” after the GCS score, indicating that they were intubated when the examination took place, so you might see a score of 5T, for instance. The GCS is done at intervals in the neurointensive care unit to document a person’s recovery.

Post-traumatic amnesia (PTA) is another good estimate for severity of a brain injury. Anytime a person has a major blow to the head he or she will not remember the injury and related events for sometime afterward. People with these injuries might not recall having spoken to someone just a couple of hours ago and may repeat things they have already said. This is the period of post-traumatic amnesia. The longer the duration of amnesia, the more severe the brain damage.

CT or MRI Scan Results

The cranial tomography (CT) scan is a type of X-ray that shows problems in the brain such as bruises, blood clots, and swelling. CT scans are not painful. People with moderate to severe TBI will have several CT scans while in the hospital to keep track of lesions (damaged areas in the brain). In some cases, a magnetic resonance imaging (MRI) scan may also be performed. This also creates a picture of the brain based on magnetic properties of molecules in tissue. Most people with severe TBI will have an abnormality on a CT scan or MRI scan. These scans cannot detect all types of brain injuries, so it is possible to have a severe TBI and be in coma even though the scan results are normal.

Brain tissue response to injury

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.
Rehabilitation sets in motion the process of adaptation and change. Keep in mind that formal rehabilitation, such as received in a hospital from professional therapists, is a good initial step, but in most cases this must be followed by outpatient therapies and stimulating activities in the injured person’s home.

*What is the TBIMS?*

The TBIMS is a group of 16 medical centers funded by the National Institute on Disability and Rehabilitation Research (NIDRR). The TBIMS works to maintain and improve a cost-effective, comprehensive service delivery system for people who experience a TBI, from the moment of their injury and throughout their life span.

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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 & Associated Functions

The brain is made up of six parts that can be injured in a head injury. 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.
<table>
<thead>
<tr>
<th>Six parts</th>
<th>Functions</th>
</tr>
</thead>
</table>
| 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 Lobes | - Vision |
| Temporal Lobes | - Hearing ability
               - Memory acquisition
               - Some visual perceptions such as face recognition and object identification
               - Categorization of objects
               - Understanding or processing verbal information
               - Emotion |
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.

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 (sluggishness)
- 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.
More in the Understanding TBI series

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- Understanding TBI, Part 3: The recovery process
- Understanding TBI, Part 4: The impact of a recent TBI on family members and what they can do to help with recovery

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Common stages

In the first few weeks after a brain injury, swelling, bleeding or changes in brain chemistry often affect the function of healthy brain tissue. The injured person’s eyes may remain closed, and the person may not show signs of awareness. As swelling decreases and blood flow and brain chemistry improve, brain function usually improves. With time, the person’s eyes may open, sleep-wake cycles may begin, and the injured person may follow commands, respond to family members, and speak. Some terms that might be used in these early stages of recovery are:

- **Coma:** The person is unconscious, does not respond to visual stimulation or sounds, and is unable to communicate or show emotional responses.

- **Vegetative State:** The person has sleep-wake cycles, and startles or briefly orients to visual stimulation and sounds.

- **Minimally Conscious State:** The person is partially conscious, knows where sounds and visual stimulation are coming from, reaches for objects, responds to commands now and then, can vocalize at times, and shows emotion.

A period of confusion and disorientation often follows a TBI. A person’s ability to pay attention and learn stops, and agitation, nervousness, restlessness or frustration may appear. Sleeping patterns may be disrupted. The person may overreact to stimulation and become physically aggressive. This stage can be disturbing for family because the person behaves so uncharacteristically.

Inconsistent behavior is also common. Some days are better than others. For example, a person may begin to follow a command (lift your leg, squeeze my finger) and then not do so again for a time. This stage of recovery may last days or even weeks for some. In this stage of recovery, try not to become anxious about inconsistent signs of progress. Ups and downs are normal.

Later stages of recovery can bring increased brain and physical function. The person’s ability to respond may improve gradually.

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Length of recovery

The fastest improvement happens in about the first six months after injury. During this time, the injured person will likely show many improvements and may seem to be steadily getting better. The person continues to improve between six months and two years after injury, but this varies for different people and may not happen as fast as the first six months. Improvements slow down substantially after two years but may still occur many years after injury. Most people continue to have some problems, although they may not be as bad as they were early after injury. Rate of improvement varies from person to person.

Long-term impacts

It is common and understandable for family members to have many questions about the long-term effects of the brain injury on the injured person’s ability to function in the future. Unfortunately, it is difficult to determine the long-term effects for many reasons.

- First, brain injury is a relatively new area of treatment and research. We have only begun to understand the long-term effects in patients one, five, and ten years after injury.
- Brain scans and other tests are not always able to show the extent of the injury, so it is sometimes difficult early on to fully understand how serious the injury is.
- The type of brain injury and extent of secondary problems such as brain swelling varies a great deal from person to person.
- Age and pre-injury abilities also affect how well a person will recover.

We do know that the more severe the injury the less likely the person will fully recover. The length of time a person remains in a coma and duration of loss of memory (amnesia) following the coma are useful in predicting how well a person will recover.

The Rancho Los Amigos Levels of Cognitive Functioning (RLCF) is one of the best and most widely used ways of describing recovery from brain injury. The RLCF describes ten levels of cognitive (thinking) recovery. Research has shown that the speed at which a person progresses through the levels of the RLCF can predict how fully a person will recover.

The Rancho Los Amigos Levels of Cognitive Functioning

Level 1 — No Response: Person appears to be in a deep sleep.
Level 2 — Generalized Response: Person reacts inconsistently and not directly in response to stimuli.
Level 3 — Localized Response: Person reacts inconsistently and directly to stimuli.
Level 4 — Confused/Agitated: Person is extremely agitated and confused.
Level 5 — Confused-Inappropriate/Non-agitated: Person is confused and responses to commands are inaccurate.
Level 6 — Confused-Appropriate: Person is confused and responds accurately to commands.
Level 7 — Automatic-Appropriate: Person can go through daily routine with minimal to no confusion.
Level 8 — Purposeful-Appropriate: Person has functioning memory, and is aware of and responsive to their environment.
Level 9 — Purposeful-Appropriate: Person can go through daily routine while aware of need for stand by assistance.
Level 10 — Purposeful-Appropriate/Modified Independent: Person can go through daily routine but may require more time or compensatory strategies.
Recovery two years after brain injury

Based on information of people with moderate to severe TBI who received acute medical care and inpatient rehabilitation services at a TBI Model System, two years post-injury:

- Most people continue to show decreases in disability.
- 34% of people required some level of supervision during the day and/or night.
- 93% of people are living in a private residence.
- 34% are living with their spouse or significant other; 29% are living with their parents.
- 33% are employed; 29% are unemployed; 26% are retired due to any reason; and 3% are students.

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How does brain injury affect family members?

For most family members, life is not the same after TBI. We want you to know that you are not alone in what you are feeling. While everyone’s situation is a bit different, there are some common problems that many family members experience such as less time for yourself, financial difficulties, role changes of family members, problems with communication, and lack of support from other family members and friends. These are just some of the problems that family members may face after injury. Sometimes these problems can seem too much and you may become overwhelmed, not seeing any way out. Family members have commonly reported feeling sad, anxious, angry, guilty, and frustrated.

Ways to reduce stress

Since the injury, you have likely been under a great deal of stress. A little stress is part of life, but stress that goes on for a long time can have a negative effect on the mind and body.

Stress is related to medical problems such as heart disease, cancer, and stroke.

- Stress can make you do things less well because it affects your ability to concentrate, to be organized, and to think clearly.
- Stress also has a negative effect on your relationships with other people because it makes you irritable, less patient, and more likely to lash out at others.
- Stress can lead to depression and/or anxiety.

If you are under constant stress, you are not going to be as helpful to your injured family member or anyone else. If you do not take the time to rest and care for yourself, you will get fewer things done, which will lead to more stress. If you won’t do this for yourself, do it for your injured family member. They will be better off if you are healthy and rested. Here are some suggestions for ways to reduce stress and stay healthy. These things have worked for many people, but not all of them may work for you. The important thing is that you begin thinking about ways to improve your life.

Learn to relax

Taking a few moments to relax can help you be more ready for the things you need to do. Learning to relax is not easy, especially in your current situation. There are relaxation techniques that can help you such as breathing...
deeply and focusing on your breathing, stating a word or phrase that has positive meaning (e.g., peace), or visual imagery. In order to train your body and mind to relax, you need to practice often. Don’t give up if it doesn’t work right away. If you keep practicing these techniques, you will feel more relaxed in the long run, and you will find that you’re able to function better in all areas of your life.

Learn which coping strategies work for you

No matter what was going on in your life before, the injury has caused changes. You may never have experienced anything similar to the injury, and some of your usual coping strategies may not work in your current situation. The best thing that you can do for yourself is to be open to trying new ways of coping and find out what works for you.

Some coping strategies that others have found helpful:

• Taking time for yourself
• Keeping a regular schedule for yourself
• Getting regular exercise such as taking a 20-30 minute walk each day
• Participating in support groups
• Maintaining a sense of humor
• Being more assertive about getting the support you need
• Changing roles and responsibilities within the family

Learn how to reward yourself

Everyone needs something to look forward to. You’ll probably say, “I have no time; it’s impossible.” Just remember that you will be more ready to do the things you have to do if you take some time to do some things that you want to do. Even if you have very limited time, you can find some small way to reward yourself. Promise yourself a cup of your favorite coffee or an opportunity to watch a good TV show or read something you enjoy.

Problem-solving for caregivers

Sometimes you may feel overwhelmed by problems. There may be so many problems that you’re not sure which one to tackle first. You can only solve one problem at a time, so pick one. Use the problem solving steps below to find a good solution. Try to choose a smaller problem to solve first. This will give you practice and make you more confident about solving bigger problems. If you deal with problems in this way, they may seem easier to handle.

Steps in Problem Solving

I. Identify the problem: What is the problem? Define it as clearly and specifically as possible. Remember that you can only solve one problem at a time.

II. Brainstorm solutions: What can be done? Think of as many things as you can. Don’t worry about whether they sound silly or realistic. This is the time to think about all possibilities, even the ones that you don’t think will happen. Be creative.

III. Evaluate the alternatives: Now you will start thinking about the consequences of the ideas you came up with in Step 2. For each idea, make a list of positives on one side of the page and a list of negatives on the other side.

IV. Choose a solution: Pick the solution with the best consequences based on your list of positives and negatives. Keep in mind that more positives than negatives is not always the best rule. Sometimes you will have one negative that outweighs many positives.

V. Try the solution: Try out the idea you have chosen. Give it more than one chance to work. If it doesn’t work right away, try to figure out why. Was there some consequence you didn’t think of? Is there another problem in the way that could be easily solved?

VI. If your first solution doesn’t work, try another one: Don’t give up. Everything doesn’t always work out the first time. You can learn from your mistakes; they may help you to choose a better solution next time.
Ways family members can help the injured person

The treatment team can provide you with guidance in how to help the person while not giving them too much or too little assistance. Attending therapy when possible and working with the therapists and nurses are the best ways to learn to help the person before discharge from the hospital.

The following recommendations are intended to help families and caregivers care for their loved one once they have returned home. Not all of the following recommendation may apply to your situation.

Provide structure and normalcy to daily life

• Establish and maintain a daily routine - this helps the person feel more secure in their environment.
• Place objects the person needs within easy reach.
• Have the person rest frequently. Don’t let the person get fatigued.
• Be natural with the person and help them to maintain their former status in the family. Communication is important to the person’s recovery. Although they may not be able to speak, they should continue to be involved in as normal a social world as possible.
• Include the person in family activities and conversations.
• Keep a calendar of activities visible on the wall. Cross off days as they pass.
• Maintain a photo album with labeled pictures of family members, friends, and familiar places.

Provide support in a respectful way

• Try not to overwhelm the person with false optimism by saying statements like “You will be alright” or “You will be back to work in no time.”
• Point out every gain the person has made since the onset of the injury. Avoid comparing speech, language or physical abilities prior to the injury with how they are now. Look ahead and help the person to do the same.
• Treat the person as an adult by not talking down to them.
• Respect the person’s likes and dislikes regarding food, dress, entertainment, music, etc.
• Avoid making the person feel guilty for mistakes and accidents such as spilling something.
• If the person has memory problems, explain an activity as simply as possible before you begin. Then as you do the activity, review with the person each step in more detail.

Avoid over-stimulation

- Agitation can be heightened by too much activity and stimulation.
• Restrict the number of visitors (1 or 2 at a time).
• Not more than one person should speak at a time.
• Use short sentences and simple words.
• Present only one thought or command at a time and provide extra response time.
• Use a calm, soft voice when speaking with the person.
• Keep stimulation to one sense (hearing, visual or touch) at a time.
• Avoid crowded places such as shopping malls and stadiums.

Safety Tips

The person who has confusion or impaired judgment may be unable to remember where dangers lie or to judge what is dangerous (stairs, stoves, medications). Fatigue and inability to make the body do what one wants can lead to injury. Therefore it is very important that a brain injured person live in an environment that has been made as safe as possible. The following are some safety guidelines to use in the home:
• Keep clutter out of the hallway and off stairs or anywhere the person is likely to walk. Remove small rugs that could cause tripping or falls.
• Remove breakables and dangerous objects (matches, knives, and guns).
• Keep medications in a locked cabinet or drawer.
• Get the doctor’s consent before giving the person over-the-counter medication.
• Limit access to potentially dangerous areas (bathrooms, basement) by locking doors if the person tends to wander. Have the person wear an identification bracelet in case he or she wanders outside.
• Keep the person’s bed low. If they fall out of the bed, you may want to place the mattress on the floor or install side rails.
• Make sure rooms are well lit, especially in the evening. Night-lights can help prevent falls.
• Have someone stay with the person who is severely confused or agitated.
• Keep exit doors locked. Consider some type of exit alarm, such as a bell attached to the door.
• Consider a mat alarm under a bedside rug to alert others if the person gets up during the night.

Things that can be more dangerous after a TBI and should be resumed only after consulting a health care professional: contact sports, horseback riding, swimming, hunting or access to firearms, power tools or sharp objects, riding recreational vehicles, and cooking without supervision.

Individuals with brain injury should receive permission from a health care professional prior to using alcohol or other substances at any point after their injury. Also, NO DRIVING until approved by your doctor.

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Neuropsychology

Neuropsychologists are psychologists with specialized training working with people who’ve developed a neurological problem, such as a stroke. The neuropsychologist on your treatment team has three primary roles in working with you:

1. To identify and make treatment recommendations regarding any emotional distress you may be experiencing, e.g. anxiety, depression, etc. Treatment may include therapy and/or medication.

2. To identify and make treatment recommendations regarding any cognitive difficulties you may be experiencing. Cognitive difficulties that may occur after stroke include concentration/attention, memory, language (expressing oneself clearly and understanding others), spatial skills, problem-solving, etc.

3. Patient and family education regarding stroke symptoms, recovery, and post-stroke sexuality.
Emotional Problems after Traumatic Brain Injury

A brain injury can change the way people feel or express emotions. An individual with TBI can have several types of emotional problems.

**Difficulty controlling emotions or “mood swings”**

Some people may experience emotions very quickly and intensely but with very little lasting effect. For example, they may get angry easily but get over it quickly. Or they may seem to be “on an emotional roller coaster” in which they are happy one moment, sad the next and then angry. This is called emotional lability.

**What causes this problem?**

- Mood swings and emotional lability are often caused by damage to the part of the brain that controls emotions and behavior.
- Often there is no specific event that triggers a sudden emotional response. This may be confusing for family members who may think they accidently did something that upset the injured person.
- In some cases the brain injury can cause sudden episodes of crying or laughing. These emotional expressions or outbursts may not have any relationship to the way the person feels (in other words, they may cry without feeling sad or laugh without feeling happy). In some cases the emotional expression may not match the situation (such as laughing at a sad story). Usually the person cannot control these expressions of emotion.

**What can be done about it?**

- Fortunately, this situation often improves in the first few months after injury, and people often return to a more normal emotional balance and expression.
- If you are having problems controlling your emotions, it is important to talk to a physician or psychologist to find out the cause and get help with treatment.
- Counseling for the family can be reassuring and allow them to cope better on a daily basis.
- Several medications may help improve or stabilize mood. You should consult a physician familiar with the emotional problems caused by brain injury.
What family members and others can do:

- Remain calm if an emotional outburst occurs, and avoid reacting emotionally yourself.
- Take the person to a quiet area to help him or her calm down and regain control.
- Acknowledge feelings and give the person a chance to talk about feelings.
- Provide feedback gently and supportively after the person gains control.
- Gently redirect attention to a different topic or activity.

Anxiety

Anxiety is a feeling of fear or nervousness that is out of proportion to the situation. People with brain injury may feel anxious without exactly knowing why. Or they may worry and become anxious about making too many mistakes, or “failing” at a task, or if they feel they are being criticized. Many situations can be harder to handle after brain injury and cause anxiety, such as being in crowds, being rushed, or adjusting to sudden changes in plan.

Some people may have sudden onset of anxiety that can be overwhelming (“panic attacks”). Anxiety may be related to a very stressful situation—sometimes the situation that caused the injury—that gets “replayed” in the person’s mind over and over and interferes with sleep (“post traumatic stress disorder”). Since each form of anxiety calls for a different treatment, anxiety should always be diagnosed by a mental health professional or physician.

What causes anxiety after TBI?

- Difficulty reasoning and concentrating can make it hard for the person with TBI to solve problems. This can make the person feel overwhelmed, especially if he or she is being asked to make decisions.
- Anxiety often happens when there are too many demands on the injured person, such as returning to employment too soon after injury. Time pressure can also heighten anxiety.
- Situations that require a lot of attention and information-processing can make people with TBI anxious. Examples of such situations might be crowded environments, heavy traffic or noisy children.

What can be done about anxiety?

- Try to reduce the environmental demands and unnecessary stresses that may be causing anxiety.
- Provide reassurance to help calm the person and allow them to reduce their feelings of anxiety when they occur.
- Add structured activities into the daily routine, such as exercising, volunteering, church activities or self-help groups.
- Anxiety can be helped by certain medications, by psychotherapy (counseling) from a mental health professional who is familiar with TBI, or a combination of medications and counseling.

Depression

Feeling sad is a normal response to the losses and changes a person faces after TBI. Feelings of sadness, frustration and loss are common after brain injury. These feelings often appear during the later stages of recovery, after the individual has become more aware of the long-term situation. If these feelings become overwhelming or interfere with recovery, the person may be suffering from depression.

Symptoms of depression include feeling sad or worthless, changes in sleep or appetite, difficulty concentrating, withdrawing from others, loss of interest or pleasure in life, lethargy (feeling tired and sluggish), or thoughts of death or suicide.

Because signs of depression are also symptoms of a brain injury itself, having these symptoms doesn’t necessarily mean the injured person is depressed. The problems are more likely to mean depression if they show up a few months after the injury rather than soon after it.

What causes depression?

- Depression can arise as the person struggles to adjust to temporary or lasting disability and loss or to changes in one’s roles in the family and society caused by the brain injury.
Depression may also occur if the injury has affected areas of the brain that control emotions. Both biochemical and physical changes in the brain can cause depression.

What can be done about depression?
- Anti-depressant medications, psychotherapy (counseling) from a mental health professional who is familiar with TBI, or a combination of the two, can help most people who have depression.
- Aerobic exercise and structured activities during each day can sometimes help reduce depression.
- Depression is not a sign of weakness, and it is not anyone's fault. Depression is an illness. A person cannot get over depression by simply wishing it away, using more willpower or "toughening up."
- It is best to get treatment early to prevent needless suffering. Don't wait.

Temper outbursts and irritability
Family members of individuals with TBI often describe the injured person as having a "short fuse," "flying off the handle" easily, being irritable or having a quick temper. Studies show that up to 71% of people with TBI are frequently irritable. The injured person may yell, use bad language, throw objects, slam fists into things, slam doors, or threaten or hurt family members or others.

What causes this problem?
Temper outbursts after TBI are likely caused by several factors, including:
- Injury to the parts of the brain that control emotional expression.
- Frustration and dissatisfaction with the changes in life brought on by the injury, such as loss of one's job and independence.
- Feeling isolated, depressed or misunderstood.
- Difficulty concentrating, remembering, expressing oneself or following conversations, all of which can lead to frustration.
- Tiring easily.
- Pain.

What can be done about temper problems?
- Reducing stress and decreasing irritating situations can remove some of the triggers for temper outbursts and irritability.
- People with brain injury can learn some basic anger management skills such as self-calming strategies, relaxation and better communication methods. A psychologist or other mental health professional familiar with TBI can help.
- Certain medications can be prescribed to help control temper outbursts.

Family members can help by changing the way they react to the temper outbursts:
- Understand that being irritable and getting angry easily is due to the brain injury. Try not to take it personally.
- Do not try to argue with the injured person during an outburst. Instead, let him or her cool down for a few minutes first.
- Do not try to calm the person down by giving in to his or her demands.
- Set some rules for communication. Let the injured person know that it is not acceptable to yell at, threaten or hurt others. Refuse to talk to the injured person when he or she is yelling or throwing a temper tantrum.
- After the outburst is over, talk about what might have led to the outburst. Encourage the injured person to discuss the problem in a calm way. Suggest other outlets, such as leaving the room and taking a walk (after letting others know when he/she will return) when the person feels anger coming on.

Questions to ask your physician or treatment provider to better understand your problem
If you or your family members are experiencing anxiety, feelings of sadness or depression, irritability or mood swings, consider asking your doctor:
- Would psychological counseling be helpful?
- Would an evaluation by a psychiatrist be helpful?
Are there medications that can help?

More about medications
If you or your family member tries a medication for one of these problems, it is very important to work closely with the physician or other health care provider who prescribes them. Always make a follow-up appointment to let him or her know how the medication is working, and report any unusual reactions between appointments. Remember that:
- There can be a delay until the beneficial effects of medications are felt.
- Doses might need to be adjusted by your doctor for maximum benefit.
- You may need to try one or more different medications to find the one that works best for you.
- Except in an emergency, you should not stop taking a prescribed medication without consulting your doctor.

Peer and other support
Remember, too, that not all help comes from professionals! You may benefit from:
- A brain injury support group — some are specialized for the person with TBI, others are for family members, and others are open to everyone affected by brain injury.
- Peer mentoring, in which a person who has coped with brain injury for a long time gives support and suggestions to someone who is struggling with similar problems.
- Check with your local Brain Injury Association chapter to find out more about these resources. Go to http://www.biausa.org/ to find brain injury resources near you.
- Talk to a friend, family member, member of the clergy or someone else who is a good listener.

Recommended reading

Disclaimer
This information is not meant to replace the advice from a medical professional. You should consult your health care provider regarding specific medical concerns or treatment.

Source
Our health information content is based on research evidence whenever available and represents the consensus of expert opinion of the TBI Model Systems directors.

Authorship
Emotional Problems after TBI was developed by Tessa Hart, PhD and Keith Cicerone, PhD, in collaboration with the University of Washington Model Systems Knowledge Translation Center.

Portions of this document were adapted from materials developed by the UAB TBI Model System, the Mayo Clinic TBI Model System, the New York TBI Model System, the Carolinas Rehabilitation and Research System, and from Picking up the Pieces after TBI: A Guide for Family Members, by Angelle M. Sander, PhD, Baylor College of Medicine (2002).
Changes in sexual functioning are common after TBI. If you are experiencing sexual problems, there are things you can do to help resolve these problems. The information below describes common sexual problems after TBI and ways to improve sexual functioning.

How does a traumatic brain injury affect sexual functioning?

The following changes in sexual functioning can happen after TBI:

- **Decreased Desire**: Many people may have less desire or interest in sex.

- **Increased Desire**: Some people have increased interest in sex after TBI and may want to have sex more often than usual. Others may have difficulty controlling their sexual behavior. They may make sexual advances in inappropriate situations or make inappropriate sexual comments.

- **Decreased Arousal**: Many people have difficulty becoming sexually aroused. This means that they may be interested in sex, but their bodies do not respond. Men may have difficulty getting or keeping an erection. Women may have decreased vaginal lubrication (moisture in the vagina).

- **Difficulty or Inability to Reach Orgasm/Climax**: Both men and women may have difficulty reaching orgasm or climax. They may not feel physically satisfied after sexual activity.

- **Reproductive Changes**: Women may experience irregular menstrual cycles or periods. Sometimes, periods may not occur for weeks or months after injury. They may also have trouble getting pregnant. Men may have decreased sperm production and may have difficulty getting a woman pregnant.

What causes changes in sexual functioning after TBI?

There are many reasons sexual problems happen after TBI. Some are directly related to damage to the brain. Others are related to physical problems or changes in thinking or relationships.

Possible causes of changes in sexual functioning after TBI include:

- **Damage to the Brain**: Changes in sexual functioning may be caused by damage to the parts of the brain that control sexual functioning.

- **Hormonal Changes**: Damage to the brain can affect the production of hormones, like testosterone, progesterone, and estrogen. These changes in hormones affect sexual functioning.
Sexuality after Traumatic Brain Injury

Medication Side Effects: Many medications commonly used after TBI have negative side effects on sexual functioning.

Fatigue/Tiredness: Many people with TBI tire very easily. Feeling tired, physically or mentally, can affect your interest in sex and your sexual activity.

Problems with Movement: Spasticity (tightness of muscles), physical pain, weakness, slowed or uncoordinated movements, and balance problems may make it difficult to have sex.

Self-Esteem Problems: Some people feel less confident about their attractiveness after TBI. This can affect their comfort with sexual activity.

Changes in Thinking Abilities: Difficulty with attention, memory, communication, planning ahead, reasoning, and imagining can also affect sexual functioning.

Emotional Changes: Individuals with TBI often feel sad, nervous, or irritable. These feelings may have a negative effect on their sexual functioning, especially their desire for sex.

Changes in Relationships and Social Activities: Some people lose relationships after TBI or may have trouble meeting new people. This makes it difficult to find a sexual partner.

What can be done to improve sexual functioning after TBI?

Talk with your doctor, nurse practitioner, or other health or rehabilitation professional about the problem, so they can help you find solutions. Some people may feel embarrassed talking openly about sexual issues. It may help to keep in mind that sexuality is a normal part of human functioning, and problems with sexuality can be addressed just like any other medical problem. If you are not comfortable discussing sexual problems with your doctor, it is important to find a health professional who you do feel comfortable talking with.

Get a comprehensive medical exam. This should include blood work and maybe a urine screen. Make sure you discuss with your provider any role your medications may play. Women should get a gynecology exam and men may need a urology exam. Ask your doctor to check your hormone levels.

Consider psychotherapy or counseling to help with emotional issues that can affect sexual functioning.

Adjusting to life after a TBI often puts stress on your intimate relationship. If you and your partner are having problems with your relationship, consider marital or couples therapy.

Consider starting sex therapy. A sex therapist is an expert who helps people to overcome sexual problems and improve sexual functioning. You can search for a certified sex therapist in your geographic area on the following website: http://www.aasect.org/

Talk with your partner and plan sexual activities during the time of day when you are less tired.

When having sex, position yourself so that you can move without being in pain or becoming off balance. This may mean having sex in a different way or unfamiliar position. Discuss this with your partner.

Arrange things so that you will be less distracted during sex. For example, be in a quiet environment without background noise, such as television.

If you have trouble becoming sexually aroused, it may help to watch movies or read books/magazines with erotic images and other sexual content.

There are sexual aids developed to help people with disability. A good website for these aids is: www.Mypleasure.com/education/disability/index.asp

Increasing your social network can increase the opportunity to form intimate relationships. You may consider joining a club or becoming involved in other social organizations.
Importance of safe sex

After a TBI, it is just as important for you to protect yourself from unplanned pregnancy and from sexually transmitted disease as it was before your injury. Even if a woman’s period has not returned, she can still get pregnant. Here are some tips to help with birth control and protection from sexually transmitted disease.

- Do research to help figure out what method of birth control and protection from sexually transmitted disease are best for you. The following website has some helpful information: http://www.plannedparenthood.org

- Because of changes in thinking abilities, it may be harder for you to remember to use protection or to remember to take it with you.
  - You can plan ahead by always carrying a condom or other method of protecting yourself and your partner.
  - For women who use birth control pills, or a device that must be replaced, using a calendar or alarm on a smart phone can help you remember to take the pills or change the device.

- If you are unsure whether your partner has a sexually transmitted disease or has been intimate with others who have such disease, it is safest to use a condom.

- If you have engaged in any risky sexual behavior, one of the best things you can do for yourself is to get tested for sexually transmitted diseases – and get treated if you test positive.

Resources for further information


Disclaimer

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Source

Our content is based on research evidence whenever available and represents the consensus of expert opinion of the investigators on the TBI Model Systems Directors.

Authorship

Sexuality after Traumatic Brain Injury was developed by Angelle M. Sander, Ph.D. and Kacey Maestas, Ph.D., in collaboration with the investigators of the TBI Model Systems Collaborative Project on Sexuality after TBI, and the University of Washington Model Systems Knowledge Translation Center. Portions of this document were adapted from Sexual Functioning and Satisfaction After Traumatic Brain Injury: An Educational Manual (authors: Sander AM, Moessner AN, Kendall, KS, Pappadia, MR, Hammond, FM, Cyborski CM).
Alcohol Use After Traumatic Brain Injury

Introduction

Alcohol use and TBI are closely related. Up to two-thirds of people with TBI have a history of alcohol abuse or risky drinking. Between 30-50% of people with TBI were injured while they were drunk and about one-third were under the influence of other drugs. Around half of those who have a TBI cut down on their drinking or stop altogether after injury, but some people with TBI continue to drink heavily, which increases their risk of having negative outcomes.

After TBI, many people notice their brains are more sensitive to alcohol. Drinking increases your chances of getting injured again, makes cognitive (thinking) problems worse, and increases your chances of having emotional problems such as depression. In addition, drinking can reduce brain injury recovery. For these reasons, staying away from alcohol is strongly recommended to avoid further injury to the brain and to promote as much healing as possible.

Facts about TBI and alcohol

Alcohol and brain injury recovery

- Recovery from brain injury continues for much longer than we used to think possible. Many people notice improvements for many years after injury.
- Alcohol slows down or stops brain injury recovery.
- Not drinking is one way to give the brain the best chance to heal.
- People’s lives often continue to improve many years after brain injury. Not drinking will increase the chance of improvement.

Alcohol, brain injury and seizures

- Traumatic brain injury puts survivors at risk for developing seizures (epilepsy).
- Alcohol lowers the seizure threshold and may trigger seizures.
- Not drinking can reduce the risk of developing seizures.

Alcohol and the risk of having another brain injury

- After a brain injury, survivors are at higher risk (3 to 8 times higher) of having another brain injury.

For more information, contact your nearest TBI Model Systems. For a list of TBI Model Systems, go to: http://www.msktc.org/tbi/model-system-centers

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Drinking alcohol puts survivors at an even higher risk of having a second brain injury. This may be because both brain injury and alcohol can affect coordination and balance.

- Not drinking can reduce the risk of having another brain injury.

### Alcohol and mental functioning
- Alcohol and brain injury have similar negative effects on mental abilities like memory and thinking flexibility.
- Alcohol magnifies some of the cognitive problems caused by brain injury.
- Alcohol may affect brain injury survivors more than it did before their injury.
- The negative mental effects of alcohol can last from days to weeks after drinking stops.
- Not drinking is one way to keep your mental abilities at their best and stay sharp and focused.

### Alcohol and mood
- Depression is about 8 times more common in the first year after TBI than in the general population.
- Alcohol is a “depressant” drug, and using alcohol can cause or worsen depression.
- Alcohol can reduce the effectiveness of antidepressant medications. People who are taking antidepressants should not drink alcohol.
- One way to improve problems with sadness or depression after TBI is to stop or cut down on the use of alcohol.

### Alcohol and sexuality
- Lowered desire is the most common effect of TBI on sexuality.
- Alcohol reduces testosterone production in males.
- Alcohol reduces sexual performance (erection and ejaculation) in men.
- Alcohol reduces sexual satisfaction in men and women.
- Avoiding alcohol improves sexual ability and activity in men and women.

### How much alcohol is “safe” after TBI?
After TBI the brain is more sensitive to alcohol. This means that even one or two drinks may not be safe, especially when you need to do things that require balance, coordination and quick reactions, such as walking on uneven surfaces, riding a bicycle or driving a car. The fact is, there is no safe level of alcohol use after TBI.

### Alcohol and medications
Alcohol is especially dangerous after TBI if you are taking certain prescription medications. Alcohol can make some medicines less effective and can greatly increase the effects of others, potentially leading to overdose and death. Using alcohol along with anti-anxiety medications or pain medications can be highly dangerous because of the possible multiplying effect.

### What about using other drugs?
Alcohol is a drug. Almost everything mentioned above about alcohol applies equally to other drugs. If your drug of choice is something other than alcohol—such as marijuana, cocaine, methamphetamine or prescription drugs, anti-anxiety medications (benzodiazepines such as Ativan, Valium, or Xanax), or pain medication (opioids like Percocet, Oxycodone or Oxycontin)—many of the same principles apply. In addition, use of illegal drugs or misuse of prescription drugs can lead to legal problems.

If you use multiple drugs like alcohol and marijuana, or alcohol and pain pills, there is a higher risk of addiction and overdose. Using alcohol and pain medications together, or alcohol and anti-anxiety medications, has killed many people. Contact your doctor if you are drinking and using prescription drugs.

### What should you do?
The stakes are higher when people choose to use alcohol after having a TBI. Some people...
continue drinking after a TBI and don’t have any desire to change that behavior. Others know they probably should stop or reduce alcohol use, but don’t know how or have tried in the past and not been successful.

There are many ways to stop using alcohol or other drugs and many ways to reduce the potential for harm. The great majority of people who have stopped having alcohol problems did it on their own. They got no professional help or counseling and did not use Alcoholics Anonymous (AA). Don’t underestimate your ability to change if you want to.

There are many ways to change, cut down or stop drinking

The key ingredients to changing your drinking are: (1) find people who will support your efforts to change your drinking; (2) set a specific goal; (3) make clear how you will meet your goal; (4) identify situations or emotions that can trigger drinking, and figure out ways to cope with those triggers ahead of time; and (5) find ways to reward yourself for sticking to your plan and meeting your goals.

If you have questions or concerns about your drinking, there are many ways to get information or help:

- Talk to your physician about your concerns, and ask about medications that can help you resist relapse or reduce cravings for alcohol, such as naltrexone (Revia).
- Psychologists or other counselors in your brain injury rehabilitation program can help you get started on a treatment program that is right for you.
- Alcoholics Anonymous (AA) has helped millions of people. There are meetings in most towns and cities [http://www.aa.org/](http://www.aa.org/).
- Substance Abuse and Mental Health Services Administration (SAMHSA) is a federal program that can help you find a treatment facility wherever you live ([http://findtreatment.samhsa.gov/](http://findtreatment.samhsa.gov/); 800-662-4357).
- Private treatment: look in the Yellow Pages under substance abuse, chemical dependency counselor, or addiction treatment.

Reduce the harm from drinking

For those who don’t want to stop drinking, it is still possible to reduce some harm from drinking:

- Eat food and drink water before you drink alcohol. This will help reduce the sharp spike in blood alcohol level that can cause nausea, vomiting, falls, blackouts and alcohol poisoning.
- Plan your transportation so you don’t drink and drive: have a non-drinking designated driver; plan to spend the night where you are doing your drinking; or drink only at home.
- To avoid dangerous peaks in blood alcohol concentrations, drink beer rather than hard liquor, or mix hard liquor with water instead of with sweet, carbonated beverages.
- Sip your drinks slowly (no more than one per hour). Drinking too fast can make the pleasant feelings of alcohol go away.
- Drinking in bars slows some people down because of the expense. However, be sure you do not drive after drinking.
- Take vitamins B1 (thiamine), B12 and folate to reduce the chances of alcohol-related brain damage.
- Keep your drinking to no more than two drinks per day. Or cut back on certain days of the week, such as weeknights.
- Take a drinking “holiday” (days or weeks when you decide not to drink at all). This can remind you of some of the benefits of being sober.

How family members can help

No one can force another person to stop using alcohol or drugs, but you can have an influence. Attending Al Anon meetings can be a good
source of support for a friend or family member of someone who abuses alcohol or drugs, and it can help promote change. Planning an “intervention” where family and friends confront the person may help.

A program called Community Reinforcement and Family Training (CRAFT) has been found to work best. CRAFT takes a more positive, motivational approach that helps loved ones make not drinking more rewarding for the person with the alcohol problem. Research has shown that alcoholics are more likely to go into treatment if their loved ones follow the CRAFT method. To learn about CRAFT, see the book Get Your Loved One Sober in the Resources section below, or find a counselor familiar with this approach.

Reference

Resources
- Substance Abuse Resources and Disability Issues (SARDI); http://www.med.wright.edu/citar/sardi/index.html.

Source
Our health information content is based on research evidence whenever available and represents the consensus of expert opinion of the TBI Model System directors.

Authorship
Alcohol Use After Traumatic Brain Injury was developed by Charles Bombardier, PhD, in collaboration with the University of Washington Model Systems Knowledge Translation Center.

Disclaimer
This information is not meant to replace the advice from a medical professional. You should consult your health care provider regarding specific medical concerns or treatment.
Your physical therapist will perform an initial evaluation to test your strength, joint movement, sensation and mobility. The therapist will then develop an individualized treatment program based on the results of the evaluation.

This program may include strengthening and conditioning exercises, balance activities, and training for functional mobility such as walking or using a wheelchair. You and your family/caregiver will also be actively involved in education.

Your family/caregiver will be educated on how to help you do the things that you may not be able to do for yourself at this time.

The overall goal is to increase your independence by working toward overcoming the physical disability caused by the brain injury so that you may return to a satisfying, productive lifestyle.
BARRIER – FREE DESIGN

This information will help you decrease obstacles in the following rooms of your home:

a. Barrier – free bathroom  
b. Barrier – free kitchen  
c. Barrier – free bedroom  
d. Barrier – free ramp

A barrier prevents a person from using a building or part of that building. For a person in a wheelchair, this would be stairs, a curb, or a narrow doorway. Here are some things you need to know to make your home barrier-free.

**BATHROOM**

1. Doors should open out into the hall to avoid taking up space inside the bathroom.

2. The bottom of the sink should be 29-inches from the floor. There should be an open space under the sink. Exposed pipes must be insulated or covered.

3. The bottom of the mirror over the sink should be 40-inches from the floor.

4. Lever handles on water facets are recommended.

5. Toilet seats should be the same height as the wheelchair seat. When it is possible, a padded, elevated seat may be necessary.

6. Grab bars should be placed by or around the toilet and in the tub for safety (always mounted in the wall studs).

7. You may need a transfer style tub bench to enter/exit your bathtub safely.

8. A roll-in shower should be 5-feet wide and 5-feet long with a level entryway and a drain that is level or slightly below the level of the floor.

9. A stand-in shower should be at least 32-inches wide to leave room for a shower chair.

10. A flexible handheld shower hose for the tub or shower is recommended.

11. There should be no throw rubs on the bathroom floor.
GRAB BAR PLACEMENTS FOR TOILET TRANSFERS

a. For standing or sitting transfers:
   1. An 18-inch to 24-inch grab bar is needed.
   2. It should be placed either horizontal or vertical (not diagonally) on the wall beside the toilet.
   3. Grab bar should be mounted 33-36” from floor.
   4. Space between a grab bar and the wall must be exactly 1” to 1-1/2” – a wider gap is dangerous because user’s arm could slip between wall and bar.
   5. Grab bars must be firmly attached in wall studs and capable of supporting 250 lbs.

   (add illustration)

b. For toilets with no side wall nearby:
   1. An 18 to 24-inch grab bar is needed.
   2. Placed 33-36” up from floor level.
   3. It needs to have a bar coming down which is bolted to the floor.
   4. You may use a bar coming from the back wall (Figure A).
   5. You may use brackets attached to the toilet seat (Figure B).

   (add illustration)
BATHTUB

Grab bars at the tub can be placed at many different positions. The important point is to place them where the patient will be able to use them.

To transfer to bottom of tub:
1. An 18 to 24 inch grab bar is needed (Figure A).
2. Place the bar across the wall and secure it into a stud for stability (horizontal placement).
3. The bar should be 2 inches above the top of the tub.

To transfer using a shower bench or shower chair:
1. An 18 to 24 inch grab bar is needed (Figure B).
2. Most benches will have an armrest attached and allow one to sit down before lifting legs over side of tub.
3. For the chair, place the grab bar across the wall 10 inches above the top of the tub.

For standing transfers:
1. An 18 to 24 inch grab bar is needed (Figure C).
2. Place the grab bar across the wall at the end of the tub. Vertical placement is suggested for people who just need hand support to step over wall.
3. Place the bar up and down on the wall near the faucet.

(add illustration)
SHOWER

A roll-in shower does not need bars, but would assist other standing users for general safety.

For a bench shower:

1. An 18 to 24 inch bar is needed (Figure A).
2. Place the bar across the shower at waist level (horizontal).
3. Place the bar under the showerhead (horizontal).

For a standing shower:

1. Use a L-shaped grab bar (Figure B).
2. It should be 18 to 24 inches long.
3. Place the bar on the side or the end of the shower near the faucets.

(add illustration)
BEDROOM

1. The bed should have a firm mattress and be as close to the same height as the wheelchair seat as possible.
2. If the bed is placed in a corner against the wall, it will be more sturdy to get in and out of.
3. You should be able to get (or fit) the wheelchair beside the bed.

KITCHEN

1. Tables and counters should be 30 to 32 inches high.
2. Open space under the sink will be needed for the wheelchair.
3. Exposed pipes under the sink should be insulated or covered.
4. Controls on the front of the stove are better than those on top.
5. An oven door hinged on the side is better than one hinged at the bottom.
6. Cabinets should be low enough to be reached from a wheelchair.

CLOSETS

Closets should have a clothes rod low enough to be reached from a wheelchair.

FLOORS

Tile floors, hardwood floors, or low pile carpet are best if a wheelchair is used. It is easier to propel on these surfaces, as opposed to thicker pile carpet.
WHEELCHAIR RAMP SPECIFICATIONS

A ramp constructed to increase wheelchair accessibility must be a proper length, to avoid the hazards posed to a helper and/or a wheelchair user when an incline is too steep. The formula for a proper ramp is for every 1-inch of vertical rise there needs to be 12-inches of ramp length. This 1:12 ratio is termed a minimal slop (ADA specifications) and allows a person to safely propel himself up this slop or will allow a helper to push a wheelchair-bound without unnecessary exertion of the helper. PLEASE DO NOT SKIMP ON REQUIRED LENGTH OF RAMP.

GETTING STARTED WITH YOUR RAMP. First, you must measure the height of the steps plus the height to the top of the door threshold. This will give you the required length of the incline. Ramps must also have a level platform, at least 4 x 4 feet, at the entranceway and at a turn if the ramp is angled secondary to limited space in yard.

OTHER SUGGESTED REQUIREMENTS:

♦ Ramp should be at least 3 feet wide … 4 feet is better!
♦ Use deck-grade planks, not plywood.
♦ Should have non-skid surface.
♦ Should have curbing on either side of ramp to prevent wheelchair from wheeling off the edges.
♦ A handrail is suggested when a helper is involved, or if the patient is walking up the ramp.
♦ The required level platform, 4 feet square, needs to be added on to the calculated length of the incline.

Let’s suppose that the height of the steps at a door is found to be 10 inches from the ground to the door threshold. To provide a proper incline, the ramp should be 10 feet long, but remember, you also need a level platform right outside the entrance, unless there is an existing porch, so you have to add another 4 ft. to the construction, with the actual slope being 10 ft. long (see picture). * If there is already a porch 4 x 4 feet then you only need to either level the porch with the threshold step or ramp the threshold step if there is adequate room.

(add illustration)
Ways to prevent pressure sores

Check your skin completely twice a day, once in the morning and once at night.

- Carefully look for skin damage or redness, especially on bony areas.

* The four most common areas for a pressure sore to develop in individuals are on the sacrum, or tailbone, the heel of the foot, the ischium, which is at the base of the buttocks and the bony areas of the foot. The trochanter or hip is another area at high risk for individuals who spend a lot of time in bed. (See picture at left).

* Always use proper equipment when seated or lying down. Have a doctor or qualified professional recommend what specialized equipment you need to protect your skin.

- Your seat cushion needs to fit your body and your chair. It needs to be properly adjusted to offer the best protection against pressure areas.
- Your mattress needs to provide proper support and protection.
- Use pillows or sheepskin to help protect areas of the body that get too much pressure.

Move often. Sitting or lying in the same position for too long causes the flow of blood to be cut off. The skin or underlying tissue begins to die, and it results in a pressure sore.

While in bed it is usually recommended that you change position at least every 2 hours.

* Keep skin clean and dry. Wet skin can become soft or inflamed and is less resistant to damage. Moisture weakens the skin and causes it to breakdown more quickly.

- Wash and dry skin right away after any bowel or bladder accident.
- Change clothes when they become wet.
- Use lotion instead of powder on your skin.

* Eat a well balanced diet. Foods high in protein, vitamins and minerals help your skin stay healthy and heal more quickly.
* Drink the recommended amount of fluids to help your skin stay soft.
- Drink plenty of water each day.
- Limit the number of caffeinated drinks like coffee, tea and soft drinks.

* Protect your skin from harm.

- Avoid movement or activities that rub, scratch or cut your skin.
- Avoid clothes and shoes that are too loose or too tight fitting.
- Avoid clothes with thick seams, buttons or zippers located in areas where they put pressure on your skin.
- Take special caution when doing transfers and participating in new activities or sports.

* Do not smoke. Smoking decreases oxygen to the skin and can make it more difficult for skin to heal.
* Do not abuse drugs or alcohol. Both can damage your skin and can also lead to other health problems.

Friction and shear from movement can contribute to pressure ulcers.

- Dragging the heels on the bed or sliding the buttocks against the bed or chair can remove the first layer of skin.
- Shear happens when the deeper tissues are pulled and torn from these shifts as well.

When sliding up in bed, the feet should be placed flat and used to help push.

When sitting upright in bed, all of the pressure is on the buttocks. Sliding down can result in friction and shear that harms the skin.

**Do not** rub red areas on the skin, as this causes shearing of the tissues below the skin surface.

Some examples of positioning options

**Side lying** use pillows and/or wedges to help keep you on your side. Try to avoid rolling fully on to the hip as pressure can build up in that area.

**Lying on your back** with heel pressure relief
People with traumatic brain injury (TBI) commonly report problems with balance. Between 30% and 65% of people with TBI suffer from dizziness and disequilibrium (lack of balance while sitting or standing) at some point in their recovery. Dizziness includes symptoms such as lightheadedness, vertigo (the sensation that you or your surroundings are moving), and imbalance.

How bad your balance problem is depends on many factors:

- How serious your brain injury is.
- Where in your brain you were injured.
- Other injuries you had along with your brain injury. For example, in a motor vehicle crash, you could suffer a TBI, cervical spine injury, and rib and leg fractures. All of these injuries will affect your ability to maintain your balance.
- Some medications used to manage the medical issues connected with the traumatic event or accident.

What is “balance”?
Balance is the ability to keep your body centered over your feet. The ability to maintain your balance is determined by many factors, including your physical strength and coordination, your senses, and your cognitive (thinking) ability.

Most people can control their body movement within certain limits before losing their balance and needing to adjust their posture or take a step to keep from falling. Adjusting your posture or taking a step to maintain your balance before, during, and after movement is a complex process that is often affected after brain injury.

Why is balance important?
When you have poor balance you have a high risk of falling and having another brain injury or broken bone. Maintaining balance while sitting and standing is important for all of our daily activities, including self care and walking. Poor balance can keep you from taking part in many types of activities, such as sports, driving, and work.

Diagnosing balance problems
Many different kinds of health care providers may be involved in diagnosing and treating balance problems, including physiatrists (physical medicine or rehabilitation doctor), neurologists, otolaryngologists (ENT), and neuro-opthalmologists. The first place to start is by having your physician review your medications, since this is a common cause of balance problems. Physical and occupational therapists may also help identify and treat balance problems.
Two commonly used tests for identifying balance problems are the Berg Balance Scale and the Dynamic Gait Index. Both of these tests can be used to track your progress as your balance improves with therapy and to provide information about potential risk of falls.

What are common causes of balance problems after traumatic brain injury?

**Medications:** A number of commonly used medications can cause dizziness, lightheadedness and decreased balance. These include some blood pressure medications, antibiotics, tranquilizers, heart medications, and anti-seizure medications. Ask your doctor if any of the medications you are taking may be causing dizziness or balance problems. A change in medications or dosages may improve the problem.

A drop in blood pressure when standing or sitting up suddenly (called **postural hypotension**) can make you feel lightheaded and dizzy. It may occur when you get up quickly from sitting on the toilet or a chair, or getting out of bed. Having your blood pressure taken while in a lying, sitting and standing position may also help diagnose blood pressure-related balance problems.

**Problems with eyesight (vision impairments):** Eyesight is one of the key senses you need to keep your balance. Eyesight problems such as double vision, visual instability, partial loss of vision, and problems with depth perception can make your balance worse.

**Inner ear problems (vestibular impairments):** Your inner ear contains many tiny organs that help you keep your balance (called the vestibular system/labyrinth). Your inner ear has three loop-shaped structures (semicircular canals) that contain fluid and have fine, hair-like sensors that monitor the rotation of your head. It also has other structures (otolith organs) that monitor linear movements of your head. These otolith organs contain crystals that make you sensitive to movement and gravity. If your vestibular system is damaged from a head injury, you may have problems with balance, dizziness, or a sudden sensation that you’re spinning. Three types of vestibular impairments are:

- **Benign paroxysmal positional vertigo (BPPV)** is one of the most common causes of vertigo. With trauma, the crystals in the inner ear can be moved out of place, making you sensitive to changes in gravity. BPPV is characterized by brief episodes of mild to intense vertigo. Symptoms are triggered by specific changes in head position, such as tipping your head up or down, and by lying down, turning over or sitting up in bed. You may also feel out of balance when standing or walking.

- **Labyrinthine concussion or injury** to the nerve to the vestibular system are also causes of vertigo and imbalance after brain injury.

- **Traumatic endolymphatic hydrops** occurs when there is a disruption of the fluid balance within the inner ear. When this happens, you may have periods of vertigo, imbalance and ringing in your ears that last for hours to days.

**Problems with your ability to sense things (sensory impairments):** For example, nerves in your feet send messages to your brain that help you keep your balance. If these nerves are damaged from your brain injury, your brain may not get the messages it needs. The brain may need to rely more on your eyesight and inner ear to keep your balance.

**Brainstem injury:** A traumatic injury to the brainstem and cerebellum (parts of the brain that control movement) can make it hard for you to walk and maintain your balance.

Leakage of inner ear fluid into the middle ear (called **perilymph fistula**) sometimes occurs after head injury. It can cause dizziness, nausea, and unsteadiness when walking or standing. It can get worse when you are more active and may get better with rest.

**Mental health issues:** Sometimes people with brain injuries have anxiety, depression or a fear of falling. These conditions can cause or increase balance problems. Doctors call this psychogenic dizziness.

**Treatment options**

Balance problems can have many different causes, each one requiring a different treatment. Your doctor, physical and occupational therapists and/
or other health care providers will work with you to understand and treat all the different causes.

Ways you can improve your balance:

Increasing your strength and flexibility will help your balance. Specific exercises include stretches for your ankle and hip muscles or strengthening activities for your legs, such as mini-squats, toe-raisers, or standing leg lifts. Go to www.nia.nih.gov/Go4Life for more information about these exercises, or talk to your doctor or physical therapist.

Find your limits in balance by moving your body over your feet as far as you can without lifting your feet. This will help you develop balance strategies to prevent losing your balance. You can also practice movements that allow you to transition from one position to another, such as going from sitting to standing, reaching above your head to get something off a shelf, or picking up something off the ground.

Practice standing or walking in different conditions. For example, you can practice standing with your eyes closed to decrease your dependency on vision for balance or stand on a pillow to improve your ability to use vision for balance. Change how far apart your feet are and work on balance by bringing them closer together, in front of one another or even stand on one leg.

Practice activities that will improve your balance while walking, such as walking longer distances; walking and keeping up with someone else while carrying on a conversation; walking over different surfaces, such as on grass and sidewalks; and walking in crowded places such as the grocery store.

Be cautious when working on your balance, and make sure you work at an appropriate level to avoid falling when no one is around. A physical or occupational therapist can help design a program that is safe for you to practice at home.

BPPV is treated by using movements to relocate the crystals in your inner ear back to where they belong. To learn more about the treatment of BPPV go to http://www.tchain.com/otoneurolgy/disorders/bppv/bppv.html.

How quickly can your balance improve?

How quickly your balance problems improve depends on the extent of injury and your health status before your injury. A condition such as BPPV can be treated effectively in one or two treatment sessions. Injuries that involve many types of impairments can take weeks, months or years. Research shows:

- Most people with TBI are able to walk independently within three months of injury. Although most can return to walking, many continue to have problems with moving quickly and with balance needed to return to high-level activities such as running or sports.
- With hard work, people with TBI can continue to improve their balance for many years after injury but balance problems are still identified more frequently in people with TBI than in people without TBI.

References


Disclaimer

This information is not meant to replace the advice from a medical professional. You should consult your health care provider regarding specific medical concerns or treatment.

Source

Our health information content is based on research evidence whenever available and represents the consensus of expert opinion of the TBI Model System directors.

Authorship

Balance Problems after TBI was developed by Michelle Peterson, PT, DPT, NCS, and Brian D. Greenwald, MD, in collaboration with the University of Washington Model Systems Knowledge Translation Center.
What is fatigue?

Fatigue is a feeling of exhaustion, tiredness, weariness or lack of energy. After TBI, you may have more than one kind of fatigue:

1. Physical fatigue: “I’m tired and I need to rest. I’m dragging today.”
2. Psychological fatigue: “I just can’t get motivated to do anything. Being depressed wears me out; I just don’t feel like doing anything.”
3. Mental fatigue: “After a while, I just can’t concentrate anymore. It’s hard to stay focused. My mind goes blank.”

Why is fatigue important?

When you are fatigued, you are less able to think clearly or do physical activities. If you are overwhelmed by fatigue, you have less energy to care for yourself or do things you enjoy. Fatigue can have a negative effect on your mood, physical functioning, attention, concentration, memory and communication. It can interfere with your ability to work or enjoy leisure activities. It can make activities such as driving dangerous.

How common is fatigue after TBI?

Fatigue is one of the most common problems people have after a traumatic brain injury. As many as 70% of survivors of TBI complain of mental fatigue.

What causes fatigue?

Fatigue is normal for anyone after hard work or a long day. In persons with TBI, fatigue often occurs more quickly and frequently than it does in the general population. The cause of fatigue after TBI is not clear but may be due to the extra effort and attention it takes to do even simple activities such as walking or talking clearly. Brain function may be less “efficient” than before the injury.

- **Physical fatigue** can come from muscle weakness. The body needs to work harder to do things that were easy before the TBI. Physical fatigue gets worse in the evening and is better after a good night’s sleep. Often this kind of fatigue will lessen as the individual gets stronger, more active and back to his or her old life.
- **Psychological fatigue** is associated with depression, anxiety and other psychological conditions. This type of fatigue gets worse with stress. Sleep may not help at all, and the fatigue is often at its worst when you wake up in the morning.
Fatigue and Traumatic Brain Injury

What can be done to decrease fatigue?

- **Mental fatigue** comes from the extra effort it takes to think after your brain is injured. Many common tasks take much more concentration than they did before. Working harder to think and stay focused can make you mentally tired.

- **Certain conditions are known to cause or increase fatigue:**
  - Depression
  - Sleep problems, such as sleep apnea
  - Seasonal allergies
  - Hypothyroidism or other endocrine gland disorders
  - Respiratory or cardiac problems
  - Headaches
  - Lack of physical exercise
  - Vitamin deficiency/poor nutrition
  - Stress
  - Low red blood cell counts (anemia)
  - Medications commonly used after TBI, such as muscle relaxers and pain medication

- **Improve your time management:**
  - Plan and follow a daily schedule. Using a calendar or planner can help manage mental fatigue.
  - Prioritize activities. Finish what is most important first.
  - Do things that require the most physical or mental effort earlier in the day, when you are fresher.
  - Avoid over-scheduling.
  - If visitors make you tired, limit time with them.

- **Exercise daily.** Research has shown that people with TBI who exercise have better mental function and alertness. Over time, exercise and being more active helps lessen physical and mental fatigue and builds stamina. It also may decrease depression and improve sleep.

- **Talk to your doctor.**
  - Discuss medical or physical problems that may be causing fatigue.
  - Have your doctor review all your current medications.
  - Tell your doctor if you think you might be depressed so treatment can be started.
  - Ask your doctor if there are any blood tests that could help to find out what is causing your fatigue.

Source

Our health information content is based on research evidence and/or professional consensus and has been reviewed and approved by an editorial team of experts from the TBI Model Systems.

Authorship

Fatigue and Traumatic Brain Injury was developed by Kathleen R. Bell, MD, in collaboration with the University of Washington Model Systems Knowledge Translation Center. Portions of this document were adapted from materials developed by the Rocky Mountain Regional Brain Injury System, Carolinas Traumatic Brain Injury Rehabilitation and Research System, and the Mayo Clinic Traumatic Brain Injury Model System.
OCCUPATIONAL THERAPY

The therapists within this department are trained to provide therapy in the areas of activities of daily living, upper extremity retraining, and visual-perceptual skills. The definition of ADL’s is any self-maintenance task such as grooming, hair care, make-up application, bathing, dressing, and toileting.

While you are here, your occupational therapist will be teaching you and your family alternative techniques for dressing, the safest and easiest way for you to take a bath, and groom yourself.

In addition, occupational therapy will focus on the skills needed to perform ADL’s. Your therapist will address upper extremity performance and fine motor coordination after a stroke.

Also, visual-perceptual skills will be addressed. Visual-perceptual skills involve your brain’s ability to interpret your world through your senses and allow you to manipulate your environment and objects to perform ADL’s.

The following pages will describe dressing techniques, visual-perceptual definitions, bathroom equipment, home modifications, and upper extremity exercises, which will be provided by your therapist.
Visual and Perceptual Problems after a Brain Injury

Although vision problems may not be the most noticeable barrier after a brain injury, they do affect your ability to move and complete your daily tasks. For example, our eyes notice that we are about to step on ice in the parking lot. Our visual system processes this information. We change the speed and direction of our feet to avoid the ice. Or, if we want to pick up a glass of water, our eyes move to locate the glass and focus on it. The brain processes this information. It moves your open hand to the glass. It grasps it and picks it up so you can take a drink.

- The Visual System includes the following:
  - Eyes
  - Nerves that connect the eyes to the brain
  - Parts of the brain that process and interpret what we see

- The Brain functions by:
  - Coordinating the eyes to move together
  - Storing what we see in our memory
  - Allowing us to adjust how we move based on what we see

The primary area for vision is in the lower, back portion of the brain called the occipital lobe.

Vision Changes after a Brain Injury

Vision starts when the eyes see an object and the image travels through the brain to the occipital lobe. The location of the brain injury and its damage will determine the different visual changes. The potential for damage of the visual system is so great, the body has a "back up" system.

Each eye receives some of the information from the left half of what we see in our environment and some from the right half. The information or image from each eye is combined, crosses over in the middle of the brain, and is then carried to the back of the brain (occipital lobes). So, if you have a brain injury on the right side of your brain, it primarily affects the vision on the left. A brain injury on the left side of the brain affects the vision on the right.
A person as seen by someone with normal vision.

The image is turned upside down when it reaches the eye.

The image from each eye is combined here.

The image of the person becomes upright and is processed in the occipital lobe.

**Vision Involves Two Processes**

1. Eye movement and taking in visual information into the brain
2. Processing and interpreting what you see

A brain injury can cause problems with one or both processes.

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**Eye Movement and Taking In Visual Information**

The first step in how vision occurs involves how the eyes move and the amount of information they take in. Problems may include:

- **Muscle Weakness:**

  The lower part of the brain is called the brainstem. It helps control eye movement. It directs the six muscles that keep the eyes moving together as you look up, down, right, and left. If a brain injury affects these muscles, it may be hard to see things move (such as watching a sporting event) or it may be hard to read.
• **Visual Field Cut (Hemianopsia):**

When both eyes are open, everything you see is called the Visual Field. The field can be divided into 4 areas. The inability to see part of the visual field is called a Visual Field Cut (Hemianopsia).

The most common loss of vision is the ability to see on one side (peripheral vision) or loss of half the visual field of each eye. This is similar to a "blind spot" when driving, which is an area where you cannot see unless you turn your head. Visual field loss may take a long time to improve or may be permanent.

• **Double Vision (Diplopia):**

If the brain injury affects the cerebellum or brainstem, you will most likely have double vision or diplopia. This occurs because the muscles that control the eyes are not able to keep them evenly aligned. A person with double vision has trouble walking because he or she cannot see the floor. Spills may occur at meals because there are "two" of every item.

Sometimes, a prism or vision therapy may be used to create single vision after a brain injury. Taping over one eye or the use of a patch minimizes the double vision. The problem with taping one eye is that it also causes a loss of depth perception. Depth perception is the ability to determine how much distance is between objects.

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### Processing and Interpreting What Is Seen

The second part of vision is processing and interpreting what we see. This is where the true "seeing" takes place. Interpreting what we see allows the brain to distinguish colors, follow patterns, remember what is seen, discriminate details, and determine directions and spatial relationships. This is called perception or visual processing.

• **Visual Neglect or Inattention:**

  > This is a common perceptual problem after a brain injury. It is caused by an inability to correctly process or pay attention to visual information on one side of the body. It is not a problem in seeing the information.

  > This deficit is more common in a right brain injury that affects the left side of the body. A person with neglect may hold their head or eyes to the right and may not look at you if you stand to their left. They may not be able to locate items on the left side of the meal tray and may run into objects on their left side.
> You may also see neglect or inattention in a left brain injury that affects the right side of the body. With this brain injury, the inattention and neglect are less obvious.

> Visual neglect can often be improved by increasing the person's awareness of the neglected side.

Who can Help the Patient with these Visual Problems?

Usually, a team of these health care providers provides the most effective treatment for visual problems after a brain injury.

- **An Occupational Therapist (OT)** will do a vision screening to identify the above problems. This screening may include visual tests and watching the patient do daily tasks such as dressing, eating, and moving in a wheelchair. Once a problem is identified, your OT may teach you ways to help compensate or retrain your vision. If the eye muscles need to be strengthened, exercises may help align them.

- **A Neuro-ophthalmologist** is a medical doctor who specializes in diseases of the eye and eye surgery.

- **An Optometrist** specializes in vision development and can diagnose and treat eye disease. They look at a person's vision as it relates to their ability to do activities at work, play, school, or sports. Treatment may include the use of lenses, prisms, low vision devices, and vision therapy.
BARRIER–FREE DESIGN

This information will help you decrease obstacles in the following rooms of your home:

a. Barrier–free bathroom
b. Barrier–free kitchen
c. Barrier–free bedroom
d. Barrier–free ramp

A barrier prevents a person from using a building or part of that building. For a person in a wheelchair, this would be stairs, a curb, or a narrow doorway. Here are some things you need to know to make your home barrier-free.

BATHROOM

1. Doors should open out into the hall to avoid taking up space inside the bathroom.

2. The bottom of the sink should be 29-inches from the floor. There should be an open space under the sink. Exposed pipes must be insulated or covered.

3. The bottom of the mirror over the sink should be 40-inches from the floor.

4. Lever handles on water facets are recommended.

5. Toilet seats should be the same height as the wheelchair seat. When it is possible, a padded, elevated seat may be necessary.

6. Grab bars should be placed by or around the toilet and in the tub for safety (always mounted in the wall studs).

7. You may need a transfer style tub bench to enter/exit your bathtub safely.

8. A roll-in shower should be 5-feet wide and 5-feet long with a level entryway and a drain that is level or slightly below the level of the floor.

9. A stand-in shower should be at least 32-inches wide to leave room for a shower chair.

10. A flexible handheld shower hose for the tub or shower is recommended.

11. There should be no throw rubs on the bathroom floor.
GRAB BAR PLACEMENTS FOR TOILET TRANSFERS

a. For standing or sitting transfers:
   1. An 18-inch to 24-inch grab bar is needed.
   2. It should be placed either horizontal or vertical (not diagonally) on the wall
      beside the toilet.
   3. Grab bar should be mounted 33-36" from floor.
   4. Space between a grab bar and the wall must be exactly 1" to 1-1/2" – a wider
      gap is dangerous because user’s arm could slip between wall and bar.
   5. Grab bars must be firmly attached in wall studs and capable of supporting
      250 lbs.

b. For toilets with no side wall nearby:
   1. An 18 to 24-inch grab bar is needed.
   2. Placed 33-36” up from floor level.
   3. It needs to have a bar coming down which is bolted to the floor.
   4. You may use a bar coming from the back wall (Figure A).
   5. You may use brackets attached to the toilet seat (Figure B).

BATHTUB

Grab bars at the tub can be placed at many different positions. The important point is to
place them where the patient will be able to use them.

To transfer to bottom of tub:
1. An 18 to 24 inch grab bar is needed (Figure A).
2. Place the bar across the wall and secure it into a stud for stability (horizontal
   placement).
3. The bar should be 2 inches above the top of the tub.

To transfer using a shower bench or shower chair:
1. An 18 to 24 inch grab bar is needed (Figure B).
2. Most benches will have an armrest attached and allow one to sit down before lifting
   legs over side of tub.
3. For the chair, place the grab bar across the wall 10 inches above the top of the tub.

For standing transfers:
1. An 18 to 24 inch grab bar is needed (Figure C).
2. Place the grab bar across the wall at the end of the tub. Vertical placement is
   suggested for people who just need hand support to step over wall.
3. Place the bar up and down on the wall near the faucet.
SHOWER

A roll-in shower does not need bars, but would assist other standing users for general safety.

For a bench shower:

1. An 18 to 24 inch bar is needed (Figure A).
2. Place the bar across the shower at waist level (horizontal).
3. Place the bar under the showerhead (horizontal).

For a standing shower:

1. Use a L-shaped grab bar (Figure B).
2. It should be 18 to 24 inches long.
3. Place the bar on the side or the end of the shower near the faucets.
These suggestions for grab bar placement include ADA guidelines and recommendations from universal design specialists.

**Tub/Shower:**

- **Vertical bar:** (18" long) at entrance to tub; bottom of bar 32 to 38" above the floor.
- **Horizontal bar on control wall:** 24" long; 34 to 38" above the floor.
- **Horizontal bar on back wall:** 32 to 48" long; 34 to 38" above the floor for shower only; 6 to 10" above top of tub for bath only.
- **Angled bar:** 24" long; bottom end 6 to 10" above top of tub (not necessary in stand-alone showers).

**Toilet:**

- **Horizontal bar at side:** 42" long (min.); 12" (max.) from the back wall; 33 to 36" above the floor.
- **Horizontal bar behind:** 24" long (min.); 6" (max.) from the side wall; 33 to 36" above the floor.
BEDROOM

1. The bed should have a firm mattress and be as close to the same height as the wheelchair seat as possible.
2. If the bed is placed in a corner against the wall, it will be more sturdy to get in and out of.
3. You should be able to get (or fit) the wheelchair beside the bed.

KITCHEN

1. Tables and counters should be 30 to 32 inches high.
2. Open space under the sink will be needed for the wheelchair.
3. Exposed pipes under the sink should be insulated or covered.
4. Controls on the front of the stove are better than those on top.
5. An oven door hinged on the side is better than one hinged at the bottom.
6. Cabinets should be low enough to be reached from a wheelchair.

CLOSETS

Closets should have a clothes rod low enough to be reached from a wheelchair.

FLOORS

Tile floors, hardwood floors, or low pile carpet are best if a wheelchair is used. It is easier to propel on these surfaces, as opposed to thicker pile carpet.
WHEELCHAIR RAMP SPECIFICATIONS

A ramp constructed to increase wheelchair accessibility must be a proper length, to avoid the hazards posed to a helper and/or a wheelchair user when an incline is too steep. The formula for a proper ramp is for every 1-inch of vertical rise there needs to be 12-inches of ramp length. This 1:12 ratio is termed a minimal slop (ADA specifications) and allows a person to safely propel himself up this slop or will allow a helper to push a wheelchair-bound without unnecessary exertion of the helper. PLEASE DO NOT SKIMP ON REQUIRED LENGTH OF RAMP.

GETTING STARTED WITH YOUR RAMP. First, you must measure the height of the steps plus the height to the top of the door threshold. This will give you the required length of the incline. Ramps must also have a level platform, at least 4 x 4 feet, at the entranceway and at a turn if the ramp is angled secondary to limited space in yard.

OTHER SUGGESTED REQUIREMENTS:

♦ Ramp should be at least 3 feet wide … 4 feet is better!
♦ Use deck-grade planks, not plywood.
♦ Should have non-skid surface.
♦ Should have curbing on either side of ramp to prevent wheelchair from wheeling off the edges.
♦ A handrail is suggested when a helper is involved, or if the patient is walking up the ramp.
♦ The required level platform, 4 feet square, needs to be added on to the calculated length of the incline.

Let’s suppose that the height of the steps at a door is found to be 10 inches from the ground to the door threshold. To provide a proper incline, the ramp should be 10 feet long, but remember, you also need a level platform right outside the entrance, unless there is an existing porch, so you have to add another 4 ft. to the construction, with the actual slope being 10 ft. long (see picture). * If there is already a porch 4 x 4 feet then you only need to either level the porch with the threshold step or ramp the threshold step if there is adequate room.
Driving is an important part of a person’s independent lifestyle and integration into the community. Because we take our driving skills for granted, it is easy to forget that driving is the most dangerous thing we do in our everyday lives. A brain injury can affect the skills needed to drive safely. If and when an injured person may safely return to driving should be addressed early in recovery. The injured person, family members, and health professionals should all be included in this important decision. If anyone has concerns that that driving may put the injured person or others in danger, health professionals may recommend pre-driving testing.

How can a TBI affect driving ability?

A brain injury can disrupt and slow down skills that are essential for good driving, such as:

- Ability to maintain a constant position in a lane.
- Having accurate vision.
- Maintaining concentration over long periods of time.
- Memory functioning, such as recalling directions.
- Figuring out solutions to problems.
- Hand-eye coordination.
- Reaction time.
- Safety awareness and judgment.

Studies indicate that even mild thinking difficulties, which may not be recognized by the injured person, may add to increased risks while driving.

Warning signs of unsafe driving

- Driving too fast/slow.
- Not observing signs or signals.
- Judging distance inaccurately when stopping or turning.
- Slow to make decisions.
- Becoming easily frustrated or confused.
- Having accidents or near misses.
- Drifting across lane markings into other lanes.
- Getting lost easily, even in familiar areas.
How often do individuals with TBI return to driving?

Between 40 and 60 percent of people with moderate to severe brain injuries return to driving after their injury. To lessen the risk of crashes, people with TBI may place limitations on their driving habits. They may drive less frequently than they did before the injury or drive only at certain times (such as during daylight), on familiar routes, or when there is less traffic. Having experienced a seizure after the TBI may be a barrier to driving. States often require that a person be free of seizures for a period of time, such as 6 months, before resuming driving. People who want to return to driving need to check with the laws in their state.

Driving evaluations and training

A driving evaluation is a crucial step in determining a person’s ability to drive following recovery from a TBI. Research studies indicate that most TBI survivors are not thoroughly evaluated for driving skills before they begin driving after the injury, and this may put TBI survivors at risk for a crash.

While there is no standardized assessment test or process, a typical driving evaluation has two parts:

- Preliminary Evaluation: A review of cognitive (thinking) abilities, including reaction time, judgment, reasoning and visual spatial skills. Recommendations regarding the need for adaptive equipment and additional skills training are based on the results of the evaluation.
- On-the-Road: A test of the mechanical operation of a vehicle, either using a driving simulator or driving a vehicle on the roadway in the presence of the evaluator. This evaluation is used to assess safe driving skills in various traffic environments, as well as basic driving skills while a client uses the appropriate adaptive driving equipment.

Current research indicates that many individuals with TBI can become competent, safe drivers when given the proper training. Training serves to improve specific driving skills. Sometimes this involves practicing driving under the supervision of a driving evaluator. In some cases a training program might focus on specific skills such as rapid understanding of visual information.

Evaluations and training are often provided by professionals certified through the Association for Driver Rehabilitation (ADED). A list of certified professionals may be found on the ADED website, www.driver-ed.org.

Vehicle modifications

If an individual with TBI has physical disabilities but has well-preserved cognitive functions, the individual may be able to resume driving with adaptive equipment and/or other modifications to the vehicle.

Recommendations for adaptive equipment and modifications could include:
- Hand-controlled gas and brake systems.
- Spinner knobs for steering.
- Left foot accelerator.
- Lifts for entering and exiting the vehicle.

Legal and insurance considerations

A person who wishes to resume driving must have a valid driver’s license. In some states there must be a formal evaluation performed by a licensing bureau before resuming driving after a brain injury. Insurance may also be required. The person should check local regulations relating to licenses and insurance.

Other transportation options

Accessible and reliable transportation is the most critical part of community integration following a TBI. If a person is not able to drive, there may be other options for transportation. Family members can provide transportation, and public transportation such as buses can be used. Some communities provide public transportation specifically for disabled riders.
Step-by-Step: Should you be driving?

1. Discuss your ability to drive with your doctor and/or health professionals, family members
2. Get a professional evaluation to determine your driving ability
3. Based on your evaluation you may be allowed to drive, need training or vehicle modification before returning to driving, or will need to use other transportation options

Recommended resources

- Brain Injury Association of America. www.biausa.org
- State Vocational Rehabilitation Offices. www.jan.wvu.edu
- Association for Driver Rehabilitation Specialists. www.driver-ed.org
- National Mobility Equipment Dealers Association. www.nmeda.org

Reference


Disclaimer

This information is not meant to replace the advice from a medical professional. You should consult your health care provider regarding specific medical concerns or treatment.

Source

Our health information content is based on research evidence whenever available and represents the consensus of expert opinion of the TBI Model Systems directors.

Authorship

Driving after TBI was developed by Thomas Novack, PhD and Eduardo Lopez, MD in collaboration with the University of Washington Model Systems Knowledge Translation Center. Portions of this document were adapted from materials developed by the University of Alabama TBI MS and JFK Johnson Rehabilitation Institute TBI MS and from Driving After Brain Injury reprinted with written permission from the Brain Injury Association of America, Inc. ©2007.
Speech therapists are trained to provide a number of services for individuals who have sustained a stroke. Your speech therapist will evaluate and treat problems in the following areas:

1. One area of focus is to evaluate for and treat for swallowing problems.

2. A second area of focus is to work with you to regain or enhance your ability to communicate your thoughts and needs clearly, as well as to understand language.

3. A third area of focus is to work with you if you are experiencing problems with cognitive skills such as memory, problem solving, confusion or disorientation.

4. As always, patient and caregiver teaching is an important component of treatment.

In this section, you will learn about these areas.
Greenville Health System
Diet Consistencies

In November of 2003, GHS adopted, with some modifications, the National Dysphagia Diet (NDD) classifications for patients with dysphagia (swallowing difficulty).

**Puree (NDD1):** Pureed (“blended” or “blenderized”), homogenous, cohesive foods, “pudding like.” Note some facilities may call this diet “Dysphagia Pureed.”

**Dysphagia (NDD2):** Consists of foods that are moist, soft-textured, and easily formed into a bolus. Meats are ground or minced no longer than 1/4” pieces. Note that other facilities may call this diet “Dysphagia mechanically altered.”

**Dysphagia Advanced (NDD3):** Consists of foods that are of nearly regular textures, with the exception of hard, sticky, or crunchy foods. Foods still need to be moist and should be in “bite size” pieces. Allows some sandwiches.

**Mechanical Soft:** This diet is not part of the NDD system. It was kept at GHS since many physicians were familiar with it, and it is sometimes ordered even when Speech Pathology is not involved. It is generally used with patients without teeth or dentures. All meats are ground.

**GI Soft:** This is not a dysphagia diet. However, it is an option for physicians to order, and consists of bland, easily digestible foods.

**Regular:** No consistency restrictions.

Note: These diet consistency levels can be ordered in conjunction with diabetic (ADA), cardiac (AHA), or renal diets.

**Liquids/Thickening**

**Regular/thin:** Any liquid textures allowed.

**Nectar-thick:** All liquids must be at least the consistency of nectar or syrup.

**Honey-thick:** All liquids must be at least the consistency of honey.

Jell-O and ice cream are considered thin liquids because of their rapid melting properties. Vegetable juice, nutritional drinks (Boost, Ensure), nutritional “shakes,” and whole milk are all considered thin liquids and must be thickened before drinking. Buttermilk is considered nectar-thick.

Soups such as chicken noodle or vegetable have broth, which is considered thin liquid. Creamed soups are considered nectar-thick.
What is cognition?
Cognition is the act of knowing or thinking. It includes the ability to choose, understand, remember and use information. Cognition includes:

- Attention and concentration.
- Processing and understanding information.
- Memory.
- Communication.
- Planning, organizing, and assembling.
- Reasoning, problem-solving, decision-making, and judgment.
- Controlling impulses and desires and being patient.

How does TBI affect cognition and what can be done about it?
After a TBI it is common for people to have problems with attention, concentration, speech and language, learning and memory, reasoning, planning and problem-solving.

Attention and concentration problems
A person with TBI may be unable to focus, pay attention, or attend to more than one thing at a time. This may result in:

- Restlessness and being easily distracted.
- Difficulty finishing a project or working on more than one task at a time.
- Problems carrying on long conversations or sitting still for long periods of time.

Since attention skills are considered a “building block” of higher level skills (such as memory and reasoning), people with attention or concentration problems often show signs of other cognitive problems as well.

What can be done to improve attention and concentration?

- Decrease the distractions. For example, work in a quiet room.
- Focus on one task at a time.
- Begin practicing attention skills on simple, yet practical activities (such as reading a paragraph or adding numbers) in a quiet room. Gradually make the tasks harder (read a short story or balance a checkbook) or work in a more noisy environment.
- Take breaks when you get tired.
Problems with processing and understanding information

After brain injury, a person's ability to process and understand information often slows down, resulting in the following problems:

- Taking longer to grasp what others are saying.
- Taking more time to understand and follow directions.
- Having trouble following television shows, movies, etc.
- Taking longer to read and understand written information including books, newspapers or magazines.
- Being slower to react. This is especially important for driving, which may become unsafe if the person cannot react fast enough to stop signs, traffic lights or other warning signs.

Individuals with TBI should not drive until their visual skills and reaction time have been tested by a specialist.

- Being slower to carry out physical tasks, including routine activities like getting dressed or cooking.

What can be done to improve the ability to process and understand information?

- Place your full attention on what you are trying to understand. Decrease distractions.
- Allow more time to think about the information before moving on.
- Re-read information as needed. Take notes and summarize in your own words.
- If needed, ask people to repeat themselves, to say something in a different way, or to speak slower. Repeat what you just heard to make sure you understood it correctly.

Language and communication problems

Communication problems can cause persons with TBI to have difficulty understanding and expressing information in some of the following ways:

- Difficulty thinking of the right word.
- Trouble starting or following conversations or understanding what others say.
- Rambling or getting off topic easily.
- Difficulty with more complex language skills, such as expressing thoughts in an organized manner.
- Trouble communicating thoughts and feelings using facial expressions, tone of voice and body language (non-verbal communication).
- Having problems reading others’ emotions and not responding appropriately to another person’s feelings or to the social situation.
- Misunderstanding jokes or sarcasm.

What can be done to improve language and communication?

Work with a speech therapist to identify areas that need work. Communication problems can keep improving for a long time after the injury.

How family members can help:

- Use kind words and a gentle tone of voice. Be careful not to “talk down” to the person.
- When talking with the injured person, ask every so often if he or she understands what you are saying, or ask the person a question to determine if he or she understood what you said.
- Do not speak too fast or say too much at once.
- Develop a signal (like raising a finger) that will let the injured person know when he or she has gotten off topic. Practice this ahead of time. If signals don’t work, try saying “We were talking about…”
- Limit conversations to one person at a time.

Problems learning and remembering new information

- Persons with TBI may have trouble learning and remembering new information and events.
- They may have difficulty remembering events that happened several weeks or months before the injury (although this often comes back over time). Persons with TBI are usually able to remember events that happened long ago.
They may have problems remembering entire events or conversations. Therefore, the mind tries to “fill in the gaps” of missing information and recalls things that did not actually happen. Sometimes bits and pieces from several situations are remembered as one event. These false memories are not lies.

What can be done to improve memory problems?
- Put together a structured routine of daily tasks and activities.
- Be organized and have a set location for keeping things.
- Learn to use memory aids such as memory notebooks, calendars, daily schedules, daily task lists, computer reminder programs and cue cards.
- Devote time and attention to review and practice new information often.
- Be well rested and try to reduce anxiety as much as possible.
- Speak with your doctor about how medications may affect your memory.

Planning and Organization Problems
- Persons with TBI may have difficulty planning their day and scheduling appointments.
- They may have trouble with tasks that require multiple steps done in a particular order, such as laundry or cooking.

What can be done to improve planning and organization?
- Make a list of things that need to be done and when. List them in order of what should be done first.
- Break down activities into smaller steps.
- When figuring out what steps you need to do first to complete an activity, think of the end goal and work backwards.

Problems with reasoning, problem-solving and judgment
- Individuals with TBI may have difficulty recognizing when there is a problem, which is the first step in problem-solving.
- They may have trouble analyzing information or changing the way they are thinking (being flexible).
- When solving problems, they may have difficulty deciding the best solution, or get stuck on one solution and not consider other, better options.
- They may make quick decisions without thinking about the consequences, or not use the best judgment.

What can be done to improve reasoning and problem-solving?
- A speech therapist or psychologist experienced in cognitive rehabilitation can teach an organized approach for daily problem-solving.
- Work through a step-by-step problem-solving strategy in writing: define the problem; brainstorm possible solutions; list the pros and cons of each solution; pick a solution to try; evaluate the success of the solution; and try another solution if the first one doesn’t work.

Inappropriate, embarrassing or impulsive behavior
Individuals with brain injuries may lack self-control and self-awareness, and as a result they may behave inappropriately or impulsively (without thinking it through) in social situations.
- They may deny they have cognitive problems, even if these are obvious to others.
- They may say hurtful or insensitive things, act out of place, or behave in inconsiderate ways.
- They may lack awareness of social boundaries and others’ feelings, such as being too personal with people they don’t know well or not realizing when they have made someone uncomfortable.
What causes it?
- Impulsive and socially inappropriate behavior results from decreased reasoning abilities and lack of control. The injured person may not reason that “If I say or do this, something bad is going to happen.”
- Self-awareness requires complex thinking skills that are often weakened after brain injury.

What can be done about it?

**Things family members can do:**
- Think ahead about situations that might bring about poor judgment.
- Give realistic, supportive feedback as you observe inappropriate behavior.
- Provide clear expectations for desirable behavior before events.
- Plan and rehearse social interactions so they will be predictable and consistent.
- Establish verbal and non-verbal cues to signal the person to “stop and think.” For example, you could hold up your hand to signal “stop,” shake your head “no,” or say a special word you have both agreed on. Practice this ahead of time.
- If undesired behavior occurs, stop whatever activity you are doing. For example, if you are at the mall, return home immediately.

Cognitive outcome/recovery and rehabilitation

Cognition is usually evaluated by a neuropsychologist. Since there are many factors that can affect how someone will improve cognitively, it is very difficult to predict how much someone will recover. With practice, cognitive problems usually improve to some degree.

Cognitive rehabilitation is therapy to improve cognitive skills and has two main approaches, **remediation** and **compensation**:
- **Remediation** focuses on improving skills that have been lost or impaired.
- **Compensation** helps you learn to use different ways to achieve a goal.

Discuss your concerns with your physician or treatment provider.

You should discuss any questions or concerns you have with a physiatrist (rehabilitation specialist) or the rehabilitation team. It is important to mention new problems as they develop. New problems could be the result of medication or require further evaluation.

Recommended reading


Source

Our health information content is based on research evidence and/or professional consensus and has been reviewed and approved by an editorial team of experts from the TBI Model Systems.

Authorship

Cognitive Problems after TBI was developed by Dawn Neumann, PhD and Anthony Lequerica, PhD, in collaboration with the University of Washington Model Systems Knowledge Translation Center.

Portions of this document were adapted from materials developed by the Rocky Mountain Regional Brain Injury System, the UAB TBI Model System, the Mayo Clinic TBI Model System, the New York TBI Model System, and from *Picking up the pieces after TBI: A guide for Family Members*, by Angelle M. Sander, PhD, Baylor College of Medicine (2002).
Parental involvement is critical when a young person is returning to school after a traumatic brain injury (TBI). Parents have the most knowledge about their child and are deeply invested in their daughter’s or son’s well-being and future. Often parents become advocates to ensure that all essential supports are in place to enhance their child’s successful return to school. Parents may also be a go-between to make sure all the necessary medical information has been provided so the school can design the best plan for the student. If the student is close to exiting school, vocational rehabilitation professionals may also be involved.

How does TBI affect students?

- The effects of TBI vary greatly from student to student; no two will be alike.
- Sometimes the effects of a brain injury are not obvious at first but become more noticeable later when thinking and social activities increase at school.

Some examples of changes that may occur after a person has sustained a TBI are:

- **Physical changes**: tiredness; lack of interest; headaches; awkward movements; slowed reactions; heightened sensitivity to light or noise.
- **Cognitive (thinking) changes**: forgetfulness; difficulty learning new material; word-finding difficulties; problems with organizing materials; easily distracted.
- **Emotional changes**: unable to deal with minor changes in the environment or daily routine; little or no expressed emotion; depression.
- **Behavioral changes**: irritability; inability to deal with unexpected events.

Planning to return to school

Much of the frustration and confusion related to returning to school can be avoided with proper planning. Rehabilitation professionals should communicate with family members and school personnel to help find the most effective ways to help the student return. This communication may need to be initiated by the student’s family.

School personnel should be contacted as soon as possible after the injury to plan for the student’s return to school. School personnel can also connect the student with services they need while they are not in school.
School systems are required to have special programs to help students with disabilities return to school. Most schools have trained special educators. However, not all special educators are familiar with the needs of students with brain injuries. On the other hand, not all students with TBI will require special programs.

In some states, a brain injury educational consultant is available through the state's Office of Special Education. This consultant helps special educators in local schools to assess and provide services to students with brain injuries.

Specific laws require schools to provide special services for students with disabilities:

- **Individuals with Disabilities Education Improvement Act (IDEA) 2004** – These laws help ensure that students with disabilities receive a free appropriate education that is designed to meet their unique needs and prepare them for employment and independent living.
- **Section 504 of the Rehabilitation Act** – Some students who are not eligible for special education services under IDEA are eligible for other support at school under Section 504.
- **American With Disabilities Act** – These laws aim to end discrimination against individuals with disabilities throughout society.

For more information about these laws, parents can contact their local Department of Education or other resources listed at the end of this factsheet.

### How can schools support students with TBI?

It is important to obtain information about the student's pre-injury cognitive abilities from current or former teachers, and from the student's rehabilitation professionals such as neuropsychologists (psychologists who specializes in brain function), speech pathologists, occupational therapists, physical therapists and social workers.

Educators and family members need to understand the nature and severity of the injury. A neuropsychologist and other rehabilitation professionals can evaluate the student's current strengths and abilities and recommend possible supports both in and out of the classroom. This information can be used to determine what classes the student should be placed in and any changes needed within the classroom.

Often a neuropsychological evaluation is used to answer questions such as:

- Can the student do the work needed to advance to the next grade or to participate in specific activities/classes (e.g. music class)?
- What are the student's cognitive strengths (e.g., ability to learn, memory for things to be done in the future, ability to plan and carry out events, ability to self-evaluate, initiative to start and finish tasks, and speed of thinking)?
- What are the student's social skills (e.g., emotional status, sensitivity, ability to handle stress)?
- What are the student's physical abilities, such as strength, balance and endurance?
- What are some of the problems the student may face, and what should educators look for?
- What classroom strategies can be used to help with attention, concentration, and learning (or other areas) for this student?

### What are possible classroom placement options?

There are basically four types of classroom placements.

- **Inclusion Class**: The student will be in a regular classroom. In addition to the teacher, a special education teacher will be available to adjust the curriculum to the student's abilities. While this arrangement allows the student to be in class with peers, it may not provide the intensive help some students need.
- **Resource Room**: Students who need intensive help to keep up with grade-level work in a particular subject may be placed in the Resource Room where a special-education teacher works with a small group of students. Resource Room placements have the benefit of providing help where needed while letting the student remain in regular classes most of the time.
- **Self-Contained Class**: Placement in a self-contained classroom means the student is taught in a small controlled setting with a special education teacher. Students in a self-contained class may be working at all different academic levels. The benefit is that the classes offer structure, routine and specialized instruction.

- **Out-of-District Placement**: Out-of-district placement requires the student to attend a specialized school specifically designed to address special learning or behavioral needs. The advantage is the high degree of specialized instruction. The disadvantage is the student does not attend the neighborhood school and misses peer interactions.

Every parent has a different opinion about placement. What is best will depend upon the student’s needs.

The following questions may help parents and school staff to think through this important decision:

- What type of setting would most likely be the most conducive to learning?
- What are the disadvantages of not remaining in the regular classroom (loss of friendships, loss of confidence, etc.)?
- What structure is needed?
- What specialized instructional techniques or technology are needed to enhance learning; where can these be provided without stigmatizing the student?
- Does the student need to focus on functional skills to enhance independent living and employment?
- Would the student benefit from learning “real” life or employment skills in setting outside of the classroom?
- Does the student plan to attend college?

Parents are advised to get input from others, including their child, teachers, other parents, special education personnel, and members of the rehabilitation team. Once the student is placed it is important to monitor his or her progress so changes can be made as needed.

**Challenging behavior in the classroom**

Several common “triggers” can cause or contribute to negative behaviors in the student with TBI.

- Students with TBI can become over-stimulated easily (from noisy hallways, crowded classes, too much information too quickly), which may lead to difficulty thinking and emotional distress.
- The student with TBI may respond negatively to an unexpected event or a lack of clear structure.
- Physical and cognitive activities at school may overwhelm the student to the point of an emotional outburst. Outbursts are more common as the student’s level of fatigue increases throughout the day.
- Negative feedback and lack of support from teachers and other students, such as ridiculing or putting rigid demands on the student, can also contribute to emotional and behavioral problems.

**Ways educators can address challenging behavior**

- Avoid labeling the student (“she hates math” or “he isn’t motivated”).
- First, talk to the student to find out what is contributing to the student’s behavioral flare-ups. Is it emotional (e.g., poor self-esteem, depression), physical (e.g., headaches, fatigue), cognitive (e.g., poor memory, inattention) and/or lack of social skills?
- Evaluate the student’s environment to determine what events may trigger behavioral problems. Also observe how the student interprets these events. The interaction of the events and the student’s interpretation of the events may help in identifying the patterns of behavioral problems.
Behavior that is counterproductive in school does not “just emerge.” It follows a pattern, which may be complex but is, nevertheless, a pattern. The educator’s task is to detect and understand the pattern through discussions with the student, family and teachers, and observation in the classroom. Based on this understanding, changes can be made that minimize “triggers” of inappropriate behavior and support the student’s learning.

Resources for Further Information

National Dissemination Center for Children with Disabilities.
www.nichcy.org

National Association of Special Education Teachers.
www.naset.org/traumaticbraininj2.0.html

Virginia Commonwealth University Rehabilitation and Research Training Center (VCURRTC) on Workplace Supports and Job Retention.
www.worksupport.com

National Longitudinal Transition Study 2.
www.nlts2.org/index.html

Pacer Center.
www.pacer.org

The National Center on Secondary Education and Transition.
www.ncset.org

Reference


Disclaimer

This information is not meant to replace the advice from a medical professional. You should consult your health care provider regarding specific medical concerns or treatment.
RECREATIONAL THERAPY

Your recreational therapist will use various recreation and leisure activities as a form of treatment to restore or improve independent physical, cognitive, social and emotional functioning.

Also, your therapist will help you to practice and relearn skills needed for activities that are enjoyable to you.

Recreational therapy will focus on community re-integration, which will take you out of the hospital and return you to the community.

During this time, you will take all of the skills learned in your rehab stay and apply them in a practical community setting while under the guidance of a therapist.

You and your family will also work with the therapist to better understand your stroke diagnosis, stroke prevention, and life after stroke.
Recreation and Leisure

Leisure and recreation are important parts of our lives. There are three major points of leisure activities:

- Relaxation
- Entertainment
- Personal Development

Many communities have opened up their recreational programs and facilities to individuals with disabilities. Taking part in sports and recreational activities following a disability is not only possible but can also be a wonderful way to meet people, make friends and depending on the activity you chose, better your health.

After a stroke, many people think they cannot enjoy the same activities as they did before. Many activities can be done with one hand such as bowling, darts, fishing and racket sports. Other activities can be adapted with special equipment such as playing cards with a cardholder.

Sporting activities from the wheelchair include archery, basketball, camping, canoeing, flying, golf, horseback riding, water and snow skiing. These activities can be done for fun or at a competitive level.

The hardest step for many people is believing they can take part in these activities and finding the resources they need to do them. The information on the next few pages can help you find these resources.
Resources for Leisure/Recreation Activities

Recreation and Parks Department:
Assist individuals with disabilities in finding classes, accessibility information and activities. There may be a therapeutic recreation specialist on staff to help clients pursue recreational activities that match individual interests and abilities.

Chamber of Commerce:
Provide information about points of interest, clubs and organizations, community events and accessibility of public buildings and transportation.

Community Colleges:
Offer academic and non-academic activities, including adaptive physical education classes, travel opportunities, recreational programs and wheelchair sports teams.

Independent Living Centers:
Sponsor recreational programs and trips; provide information on leisure opportunities available in a particular community.

Service Organizations:
The YMCA, YWCA, Boy and Girl Scouts, Red Cross and various churches offer many opportunities for individuals with disabilities to perform service in the community.

Support Groups:
Created and run by individuals with particular disabilities who share specific interests and needs. For information about groups for stroke survivors, contact the National Stroke Association at 1-(800)-STROKES or the American Stroke Association at 1-(888) 478-7653.
Recreation Equipment

**Swimming**: For many people, swimming is the perfect activity because it is inexpensive and requires little equipment. Water cushions the joints and the lack of gravity makes movement easier.

**Equipment**:
- Aquatic lifts provide access into the pool.
- Balance rings, hip belts, and neck collars are used to ease movement in the pool.

**Resources for Purchasing**:
- Sprint/Rothhammer: 1-(800) 235-2156
  www.sprintaquatics.com
- Aquatic Access: 1-(800) 325-5438
  www.aquatic-access.com
- Access to Recreation: 1-(800) 634-4351
  www.accesstr.com

**Gardening**: Gardening is good for the body and the soul. Working in a garden can be a form of physical exercise for the body and can also provide a sense of relaxation and accomplishment.

**Equipment**:
- Gardening tools with wrist supports for individuals with decreased hand control.
- There are raised garden beds that are wheelchair accessible.

**Resources for Purchasing**:
- Access to Recreation: 1-(800) 634-4351
  www.accesstr.com
Recreation Equipment, cont

**Bowling:** Bowling may be an activity that you participate in before your stroke or it may be an activity that you would like to take up now. There is adaptive equipment that may help you keep or start bowling!

**Equipment:**
- A ball pusher can be used for pushing and guiding the ball down the lane.
- A handle grip bowling ball has a handle that can be used to grip the ball instead of using the fingers.
- A bowling ramp can be used if you have limited use of your arms. The ramp is placed in front of the lane and the ball is pushed down the ramp.

**Resources for Purchasing:**
- Access to Recreation: 1-(800) 634-4351
  www.accesstr.com

**Fishing:** Fishing may be a source of relaxation for you. After your injury, you may need some assistive devices to help you keep up your hobby.

**Equipment:**
- A rod holder can be strapped around your waist to hold your fishing pole if you are unable to hold it.
- A strong arm can be used to hold your fishing pole around your wrist if you are unable to grip the pole.
- A fishing pole holder clamps onto the side of your wheelchair to hold the pole.

**Resources for Purchasing:**
- Access to Recreation: 1-(800) 634-4351
  www.accesstr.com
- Fishing Has No Boundaries (502) 898-4466
  www.apex.net/handicapable
Golf: Golf is a sport that takes dedication. There is equipment that can assist you in keeping your golf passion.

Equipment:
- Shortened clubs can be used from the wheelchair level.
- A “Backtee” can hook onto a golf tee and pull it form the ground without forcing the golfer to bend over.
- An assistive golf stick can pick-up a golf ball from a seat position.

Resources for Purchasing:
- Access to Recreation: 1-(800) 634-4351
  www.accesstr.com
- Get a Grip: (602) 728-0218
- Professional Clubmakers: 1-(800) 548-6094
  www.proclubmakers.org

Cards: Card games are a recreational activity that does not take much physical effort, but it does require fine motor skills.

Equipment:
- A card shuffler will shuffle the cards if you have limited hand use.
- A cardholder will hold the cards for you if you are unable to.

Resources for Purchasing:
- Access to Recreation: 1-(800) 634-4351
  www.accesstr.com

These are just a few recreation activities and pieces of adaptive equipment! Access to Recreation is a great resource for equipment, but you can also search the internet or contact a local recreation resource or national sports association.
Recreation and Leisure: Adaptive Equipment Catalogs

| Adaptability | Products for Independent Living  
|             | PO Box 515  
|             | Colchester, CT 06415 |
| After Therapy Catalog | Access to Recreation, Inc.  
|             | 2509 East Thousand Oaks Boulevard  
|             | Suite 430  
|             | Thousand Oaks, CA 91362  
|             | 1-(800) 634-4351 |
| Don Kreb’s – Adaptive Recreation Equipment | Access to Recreation, Inc.  
|             | 2509 East Thousand Oaks Boulevard  
|             | Suite 430  
|             | Thousand Oaks, CA 91361  
|             | 1-(800) 634-4351 |
| Sammons | PO Box 32  
|         | Brookfield, IL 60513-0032  
|         | 1-(800) 323-5547 |
Travel

Traveling does not have to be a problem for individuals with disabilities. There are several travel agencies that specialize in making travel plans for people with disabilities. Here are some tips for worry-free travel:

Call ahead to find out accessibility of the places you want to visit. Be very specific about your physical problems and your needs.

Do not take your first trip during the holidays or busy travel times. These “peak” times are already stressful for both travelers and transportation employees. Instead, take a few trips during less busy times so you can learn your way around and be better prepared for busier times down the road.

Try not to travel alone, especially in your first trip. If you do not have someone to travel with you, think about calling a travel company that specializes in planning trips for individuals with disabilities. These tours are made for people with mobility and communication problems.

If you walk slowly, tire easily, or have any questions about your endurance, think about renting a wheelchair that you can use for longer tours.
<table>
<thead>
<tr>
<th>Travel Companies</th>
<th>Address</th>
</tr>
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<tbody>
<tr>
<td><strong>Access to the World</strong></td>
<td>2828 East Colfax Avenue 80206 Denver, CO (International Tours)</td>
</tr>
<tr>
<td><strong>Tailored Tours, Inc.</strong></td>
<td>1518 North Howe 60614 Chicago, IL</td>
</tr>
<tr>
<td><strong>Evergreen Travel Service</strong></td>
<td>4114 198th Street Southwest 98036-5699 Lynwood, WA</td>
</tr>
<tr>
<td><strong>Wheelchair Wagon Tours</strong></td>
<td>PO Box 1270 32742 Kissimee, FL</td>
</tr>
<tr>
<td><strong>Flying Wheels Travel</strong></td>
<td>143 West Bridge 55060 Owatonna, MN</td>
</tr>
<tr>
<td><strong>Wheels on Tour, Inc.</strong></td>
<td>20202 Cohasset 01306 Canoga Park, CA</td>
</tr>
<tr>
<td><strong>Lampert Tours, Inc.</strong></td>
<td>1359 North Wells Street 60610 Chicago, IL</td>
</tr>
<tr>
<td><strong>Whole Person Tours</strong></td>
<td>PO Box 1084 07002 Bayonne, NJ</td>
</tr>
</tbody>
</table>
“The longer I live, the more I realize the impact of attitude on life. Attitude to me is more important than facts. It is more important than the past, then education, than money, than circumstances, than failures, than successes, then what other people think or say or do. It is more important than appearance, giftedness or skill. It will make or break a company – a church – a home. The remarkable thing is we have a choice every day regarding the attitude we will embrace for that day. We cannot change the past … We cannot change the fact that people will act in a certain way … We cannot change the inevitable. The only thing we can do is play the one string we have, and that is our attitude. I am convinced that life is 10% what happens to me and 90% how I react to it.”
Case Manager:

The case manager will provide you and your family with information about community resources and help plan for your hospital discharge and return to the community.

- Help determine your eligibility for benefits, such as Medicaid and Social Security.
- Make referral to community resources for you and your family.
- Provide ongoing supportive counseling to help you adjust to your new situation.
New to Traumatic Brain Injury?

New to South Carolina?

If you or a family member have impairments as a result of a traumatic brain injury, you should know about the following resources. This is not an exhaustive list of resources in South Carolina, but includes those that are vital when first seeking information about public resources.

The Brain Injury Alliance of South Carolina offers TBI information and resources, support groups, prevention materials, awareness events, statewide conferences and workshops for individuals with TBI, caregivers and the general public.

Toll Free: 1 (800) 290-6461  www.biausa.org/SC

If you can’t afford to pay for medical care, Medicaid can assist financially eligible people to get care from approved providers who accept Medicaid. A person must apply for Medicaid at the South Carolina Department of Health and Human Services. An electronic application is available on the website.

Toll Free: 1 (800) 549-0820  www.dhhs.state.sc.us

Medicare is a health insurance program for people age 65 and over, people under the age of 65 with certain disabilities, and people of all ages with End-Stage Renal Disease.

Toll Free: 1 (800) 633-4227  www.medicare.gov

For financial assistance, the Social Security Administration provides applications for Social Security Disability and Supplemental Security Income.

Toll Free: 1 (800) 772-1213  www.socialsecurity.gov

The SC Vocational Rehabilitation Department provides rehabilitation services for people with disabilities leading to competitive employment. The agency also serves eligible school-age individuals in an effort to support their transition into the competitive work environment. The Brain Injury Program provides services to identify barriers to employment and develop behavior and compensatory strategies to improve their work-related performance.

Toll Free: 1 (800)832-7526  www.scvrd.net

The SC Department of Education, Office of Exceptional Children, ensures that all children with disabilities in the State have a free and appropriate public education, protects the rights of these children and their parents, and provides leadership to school district and state-operated programs in the provision of appropriate special educational services.

Main Number: 1 (803) 734-8224  http://ed.sc.gov/agency/offices/sc
Protection and Advocacy for People with Disabilities provides a variety of assistance for people with disabilities who feel their rights are violated or are having difficulty accessing services.

Toll Free: 1 (866) 275-7273 www.protectionandadvocacy-sc.org

The SC Department of Mental Health provides a full range of community and inpatient services to citizens of all ages who have emotional or psychiatric problems.

Toll Free: 1 (800) 763-1024 www.state.sc.us/dmh

The SC Department of Disabilities and Special Needs, Head and Spinal Cord Injury Division, offers information and referral, service coordination to directly assist an individual in accessing all appropriate public and private resources, and an array of services and supports.

Toll Free: 1 (888) 376-4636 www.state.sc.us/dds

Community Long Term Care offers programs to help individuals who want to live at home, need assistance with their care, and are financially eligible for Medicaid.

Toll Free: 1 (888) 549-0820 www.dhhs.state.sc.us
Prepare for Emergencies Now: Information for People with Disabilities

Your ability to recover from an emergency tomorrow may depend on the planning and preparation you do today. This guide provides tips which individuals with disabilities and others with access and functional needs, and the people who assist and support them, can take to prepare for emergencies before they happen.

1 Be Informed

It is important to know what types of emergencies are likely to affect your region. For more information about specific types of emergencies, visit www.ready.gov/be-informed.

Be prepared to adapt this information to your personal circumstances and make every effort to follow instructions received from authorities on the scene. Above all, stay calm, be patient and think before you act. With these simple preparations, you can be ready for the unexpected.

2 Make a Communications Plan

A disaster can interfere with your ability to communicate with your family, friends and coworkers. It is vital to have backup plans for staying in touch with your support network, and for your network to be aware of where you will shelter or evacuate.

Create a Personal Support Network

Everyone should make a list of family, friends and others who will be part of your plan. Include a relative or friend in another area who would not be affected by the same emergency, and who can help if needed. Make sure everyone knows how you plan to evacuate your home, school or workplace, and where you will go in case of a disaster. Make sure that someone in your personal support network has an extra key to your home and knows where you keep your emergency supplies. Teach them how to use any lifesaving equipment or medicine in case of an emergency. If you use a wheelchair, oxygen or other medical equipment, show friends how to use these devices so they can move you or help you evacuate. Practice your plan with your personal support network.

If you undergo routine treatments at a clinic or hospital, or if you receive regular services at home such as home health care, meals, oxygen, or door-to-door transportation, talk to your service provider about their emergency plans. Work with them to identify back-up service providers within your area and the areas you might evacuate to. If you use medical equipment in your home that requires electricity to operate, talk to your health care provider about a back-up plan for its use during a power outage.

This information was developed by the U.S. Department of Homeland Security in consultation with AARP, the American Red Cross and the National Organization on Disability and updated by the FEMA Office of Disability Integration and Coordination.
Build an Emergency Kit

The reality of a disaster situation is that you will likely not have access to everyday conveniences. To plan in advance, think through the details of your everyday life. You should include the following in your planning:

Basic Supplies

Think first about survival basics - food, water, first aid, and tools. Plan to make it on your own for at least three days. Consider two kits. In one kit put everything you will need to stay where you are and make it on your own for a day or two. The other kit should be lightweight, smaller version you can take with you if you have to leave your home. For more information on what should go into a basic kit, please refer to www.ready.gov/basic-disaster-supplies-kit.

The second step is to Consider how an emergency might affect your individual needs. During emergencies, you may not have access to disaster assistance, a medical facility or even a drugstore. It is crucial that you and your family think about what kinds of resources you use on a daily basis, and what you might do if those resources are limited or not available.

Include Important Documents in Your Kit

Include copies of important documents in your kit, such as family records, medical records, wills, deeds, social security and bank account information, and tax records. Also be sure you have cash or travelers checks in your kits in case you need to travel in an evacuation. Depending on your needs, additional items for your emergency kit should go into a basic kit, please refer to www.ready.gov/basic-disaster-supplies-kit.

In an evacuation in case they are not working. When traveling, consider alerting hotel or motel workers if you will need help in a disaster situation. Keep your equipment with you in an evacuation, if at all possible. If you must leave your wheelchair, bring your cushion.

Consider Your Service Animal and Pets

Whether you decide to stay put or evacuate, you will need to make plans in advance for your service animal and pets. Keep in mind that what’s best for you is typically what’s best for your animals, so you must evacuate, take your pets with you if you can. However, if you go to a public shelter, it is important to remember that by law only service animals must be allowed inside. Plan in advance for shelter alternatives that will work for both you and your animals. For more information about service animal/ pet preparation, visit www.ready.gov/animals.

Fire Safety

Plan two ways out of every room in case of fire. Check for items such as bookcases, hanging pictures, or overhead lights that could fall and block an escape path. For more fire safety tips, go to http://www.usfa.fema.gov/citizens/disability/.

Contact Your Local Emergency Information Management Office

Some local emergency management offices maintain registries for people with disabilities. Some registries are open to all individuals requesting information; others may be used to offer assistance in emergencies. If you add your name and information to a registry, be sure you understand with whom you are registering. That a registry is NEVER a substitute for personal preparedness. Even if the registry may be linked to first responders, assistance may not be available for hours or even days after a disaster. Contact your local emergency management agency to see if these services exist where you live, or visit www.ready.gov/ to find links to government offices in your area.

Create a Personal Support Network (con’t)

Talk to your employer and coworkers about the assistance you might need in an emergency. This is particularly important if you need to be lifted or carried. Talk about any communication difficulties, physical limitations, equipment needs, and medication procedures that might arise during an emergency. Always participate in exercises, trainings and emergency drills offered by your employer or in your community.

Develop a Family Communications Plan

Your family may not be together when disaster strikes, so plan how you will contact one another and review what you will do in different situations. For more information on how to develop a family communications plan, visit http://www.ready.gov/family-communications.

Deciding to Stay or Evacuate

Depending on your circumstances and the nature of the emergency, the first important decision is whether to stay or go. This decision and plan for both possibilities. Use common sense and available information to determine if there is immediate danger. In any emergency, local authorities may not immediately be able to provide information on what is happening and what you should do. However, you should monitor television, radio, Internet, or social media news reports for information or official instructions as they become available. If you’re specifically told to evacuate or with friends, family or neighbors. Also consider Some registries are only used to collect planning information or official instructions as they become available. If you’re specifically told to evacuate or authorities may not immediately be able to provide alternatives that will work for both you and your animals. For more information about service animal/ pet preparation, visit www.ready.gov/animals.

Stay Safe

Whether you are at home or elsewhere, there may be situations where you should stay put or leave. Choose a sheltered area that you are and avoid any uncertainty. Consider what you can do to safely shelter-in-place alone or with friends, family, or neighbors. Also consider how a shelter designated for the public would meet your needs. Work with local emergency managers and others in your community on preparing shelters where veterans can meet access and functional needs (go to www.fema.gov/about/odic to learn more about functional needs support services in general population shelters). If you have options and decide to stay put and shelter in place, consider that you may be without electricity, phone service and accessible roads for days or longer.

Evacuation

There may be situations in which you decide to leave, or are ordered to leave. Plan how you will get away and anticipate where you will go. Choose several destinations in different directions so you have options in an emergency. Ask about evacuation plans at the places where you spend time including work, school, community organizations, and other places you frequent. If you typically rely on elevators, work with others to develop back-up plans for evacuation in case they are not working. When traveling, consider alerting hotel or motel workers if you will need help in a disaster situation. Keep your equipment with you in an evacuation, if at all possible. If you must leave your wheelchair, bring your cushion.

Basic Supplies

Think first about survival basics - food, water, first aid, and tools. Plan to make it on your own for at least three days. Consider two kits. In one kit put everything you will need to stay where you are and make it on your own for a day or two. The other kit should be lightweight, smaller version you can take with you if you have to leave your home. For more information on what should go into a basic kit, please refer to www.ready.gov/basic-disaster-supplies-kit.

The second step is to Consider how an emergency might affect your individual needs. During emergencies, you may not have access to disaster assistance, a medical facility or even a drugstore. It is crucial that you and your family think about what kinds of resources you use on a daily basis, and what you might do if those resources are limited or not available.

Include Important Documents in Your Kit

Include copies of important documents in your kit, such as family records, medical records, wills, deeds, social security and bank account information, and tax records. Also be sure you have cash or travelers checks in your kits in case you need to travel in an evacuation. Depending on your needs, additional items for your emergency kit should go into a basic kit, please refer to www.ready.gov/basic-disaster-supplies-kit.

Extra eyeglasses; backup supplies for any visual aids you use

Extra batteries for hearing aids; extra hearing aids if you have them (or if you have insurance coverage for them)

Battery chargers for motorized wheelchairs, or other powered or assistive technology devices

Supplies for your service animal. You can find more information at www.ready.gov/animals

A laminated personal communication board, if you might need assistance with being understood or understood by others

If you use a motorized wheelchair, have a light weight manual chair available for emergencies. Know the size and weight of your wheelchair, in addition to whether or not it is collapsible, in case it has to be transported.

If you have allergies or chemical sensitivities, be sure to include items that you are able to use for personal hygiene and for cleanup.

Protect your family’s access to funds in case an emergency happens. If you or those close to you are still receiving Social Security or other federal benefits by check, please consider switching to one of these safer, more practical options:

Arrange electronic payments for your paycheck and federal benefits.

The Direct Express® prepaid debit card is designed as a safe and easy alternative to paper checks for people who don’t have a bank account. Sign up is easy, call toll-free at (877) 212-9951 (phone), (856) 569-0447 (TTY) or sign up online at www.USDirectExpress.com.
**HASCi Medicaid Waiver**

Section 1915(c) of the Social Security Act enables South Carolina Department of Health and Human Services (SCDHHS) to contract with South Carolina Department of Disabilities and Special Needs (SCDSSN) to operate a Home and Community-Based (HCB) Waiver program for a limited number of people with severe physical/cognitive disabilities. It is one of several HCB Waiver programs in South Carolina that can provide some level of services to people with traumatic brain injury, spinal cord injury, or similar disability.

HASCi Waiver participants can receive Medicaid-funded services and supports in their homes and other community settings instead of in a hospital, nursing facility, or institution. The aggregate cost of Medicaid HCBS Waiver services must be no more than the aggregate cost if the same people received institutional care funded by Medicaid.

HASCi Waiver services are provided based on the identified needs of a participant and within limits and available funding.

**HASCi Waiver Participation**

To participate in the Head and Spinal Cord Injury Waiver, a person must:

- receive Service Coordination through the SCDDSN Head and Spinal Cord Injury (HASCi) Division (see back)
- request HASCi Waiver services through his or her HASCi Service Coordinator
- receive Medicaid in South Carolina or become eligible
- meet Level of Care criteria (see back)
- have urgent circumstances affecting his or her health or functional status
- depend on others to provide or assist with critical health needs, basic activities of daily living, or require daily monitoring or supervision to avoid institutionalization
- need services not available from existing resources, including family, private means, and other agencies or programs, or current resources are inadequate to meet the basic needs of the individual to allow him or her to remain in the home
- have adequate natural supports to live safely in a private residence or other community setting

The HASCi Waiver does not provide income support, emergency funds, housing, room and board, general supervision, or 24-hour care.

Initial enrollment in the HASCi Waiver is limited to people prior to their 65th birthday. Persons already enrolled continue to be eligible after their 65th birthday if all other eligibility factors are met.

A person must be offered choice between institutional services or home and community-based services, must choose to receive HASCi Waiver services, must be informed of all the alternatives available in the HASCi Waiver, and must choose from among qualified service providers.

**HASCi Waiver Services**

- **Attendant Care/Personal Assistance**: direct assistance with personal care and activities of daily living and/or supervision to assure health and safety
- **Respite Care**: short-term care and/or supervision in the absence or people normally providing care/supervision
- **Medicaid Waiver Nursing**: services within the scope of the SC Nurse Practice Act provided by an RN or LPN
- **Prescribed Drugs**: three prescriptions per month in addition to drugs available through Medicaid State Plan
- **Supplies, Equipment and Assistive Technology**: specialized medical supplies and equipment and AT devices to better perform activities of daily living
- **Personal Emergency Response System**: electronic device to enable an individual to secure help in an emergency
- **Private Vehicle Modifications**: modifications to a vehicle driven by or routinely used to transport the person
- **Environmental Modifications**: adaptations to the person’s private home to ensure health and safety or to enable greater independence
- **Occupational Therapy**: treatment prescribed by a physician to restore or improve fine motor functioning
- **Physical Therapy**: treatment prescribed by a physician to improve or compensate for mobility and movement dysfunction and related functional impairments
- **Speech and Hearing Services**: speech therapy, audiology services, and augmentative communication prescribed by a physician
- **Psychological Services**: treatment prescribed by a physician to address affective, cognitive, and substance abuse issues
- **Behavior Support**: validated practices to identify causes of specific problem behaviors and appropriate interventions to reduce or eliminate them
- **Health Education for Consumer-Directed Care**: instruction by a registered nurse to assist a person to manage own personal care provided by another person; a family member or other representative may be instructed if a person is not capable of self-management
- **Peer Guidance for Consumer-Directed Care**: information, advice, and encouragement provided by a peer to a person with SCI/severe physical impairment to recruit, train, and supervise own caregivers
- **Day Activity**: assistance with acquisition, retention, or improvement of self-help, socialization and adaptive skills, in a licensed day program funded by SCDDSN
- **Career Preparation**: preparation for paid or unpaid employment (but not job-specific skills) in a licensed day program funded by SCDDSN
- **Employment Services**: intensive/extended supports in a licensed employment program funded by SCDDSN
- **Residential Habilitation**: care, skills training, and supervision in a licensed residential program funded by SCDDSN

Revised 12/2013
Applying to SCDDSN

If you have severe impairments as a result of traumatic brain injury (TBI), spinal cord injury (SCI), or similar disability (SD), you or a family member should:

- Contact HASCI Division Information and Referral at the phone number above to be screened for referral to SCDDSN Head and Spinal Cord Injury (HASICI) Division and referral to the HASCI Waiver, if requested.
- If screened as appropriate for consideration of eligibility, you will be given opportunity to choose a DSN Board or other qualified agency which provides HASCI Service Coordination (SC) for your locality. You will be notified by mail that referral was made to the chosen SC provider.
- The applicant will be contacted by staff from the chosen SC provider to begin formal intake and SCDDSN eligibility determination.
- The SCDDSN eligibility determination process includes review of medical records and other information, including the applicant’s current functional status. The process is usually completed within 90 days.
- An applicant found ineligible for SCDDSN will be notified in writing, including reason[s] for denial. This notification will provide information on how to appeal denial of eligibility.

Eligibility Criteria

S.C. Code Ann. 544-38-370 defines eligibility for services through the DSN Head and Spinal Cord Injury Division:

“A person is eligible for case management services under this article when at the time of determining eligibility the person has a severe chronic limitation that:

1. is attributed to a physical impairment, including head injury, spinal cord injury, or both, or a similar disability, regardless of the age of onset but not associated with the process of a progressive degenerative illness or dementia, or a neurological disorder related to aging;
2. is likely to continue without intervention;
3. results in substantial functional limitations in at least two of these life activities: (a) self-care; (b) receptive and expressive communication; (c) learning; (d) mobility; (e) self-direction; (f) capacity for independent living; (g) economic self-sufficiency; and
4. reflects the person’s need for a combination and sequence of special inter-disciplinary or generic care or treatment or other services which are lifelong or extended duration and are individually planned or coordinated.”

Level of Care Criteria for HASCI Waiver

In order to be eligible for HASCI Waiver services, an individual must meet Level of Care criteria for a Nursing Facility (NF) or an Intermediate Care Facility for individuals with Intellectual Disability (ICF/IID). The person must be evaluated to meet Level of Care criteria within 30 days prior to enrollment in the HASCI Waiver. Level of Care is re-evaluated at least every 365 days.

NF Level of Care is determined by a licensed nurse who conducts a comprehensive evaluation of an individual’s medical, psychosocial, and functional needs. An individual may meet NF Level of Care at the skilled or intermediate level. Both levels focus on an individual’s need for extensive assistance from another person with personal care and activities of daily living.

To be eligible for the HASCI Waiver under the ICF/IID Level of Care, an individual must be determined to meet SCDDSN criteria for a Related Disability (onset prior to age 22 years) with substantial impairments in adaptive functioning and require ongoing supervision and services to acquire skills or prevent regression.

DDSNS Reconsideration and Medicaid Appeal

If an applicant or participant is notified of an adverse decision/action affecting eligibility for or receipt of HASCI Waiver services, within 30 days the individual (or representative) may request that SC Department of Disabilities and Special Needs reconsider and reverse the decision/action. Information on the SCDDSN Reconsideration process and how to make a request will be provided by the HASCI Service Coordinator.

If the individual (or representative) fully completes the SCDDSN Reconsideration process and is dissatisfied with the results, an appeal of the adverse decision/action may be filed with the SC Department of Health and Human Services (State Medicaid Agency) within 30 days. Information on how to file a Medicaid appeal will be provided by the HASCI Service Coordinator.

You may be eligible to receive continued Medicaid benefits pending a hearing decision. If you are interested in continued benefits, you must contact your SCDDSN Service Coordinator within ten (10) calendar days of the effective date of the action. If the hearing decision is not in your favor, you may be required to repay Medicaid benefits received during the appeals process.

HASCI Waiver Termination

HASC Waiver services are terminated when a person...

- is no longer eligible for Medicaid in South Carolina
- no longer meets Level of Care criteria
- does not receive any Waiver services for 30 days
- is admitted to an acute care hospital for 30 days

Revised 12/2013
About Skilled Nursing Facility Discharge

**How do I make a decision about short-term or SNF rehab after stroke?**

The healthcare team recommends a discharge and rehab plan based on your medical needs, activity tolerance, degree of deficit from the stroke, as well as your personal resources. You will not be discharged from the hospital until your doctor feels you are medically stable. However, the team will work to have a discharge plan in place so you can leave the hospital when the doctor feels you are ready.

**Who pays for rehab services in a SNF?**

Medicare pays 100% for the first 20 days, then 80% through the 100th day. Secondary insurance may pay the remaining 20 percent. Medicaid does NOT pay for the rehab. Other types of insurance usually follow Medicare guidelines. You should verify rehab benefits with your insurance. The facility also verifies your insurance coverage and notifies you of any out-of-pocket expense. However, insurance will only pay for rehab services as long as measurable gains in recovery are made.

**What is the difference between short-term rehab and long-term SNF admission?**

Individuals who are admitted for short-term rehab are expected to leave the facility at the end of rehab. If the stroke survivor cannot return to his/her prior living arrangements, he/she may be able to transition to long-term care in the same facility. Long-term care insurance is the only type of insurance that pays for this level of care. Long-term care is usually paid for privately, unless the person has Medicaid.

**How is a referral or request made for a SNF?**

The case manager/social worker will ask you to select at least two facilities you prefer and then will fax information to them. The SNF then has a very short time to review the information and make a bed offer based on bed availability and its ability to meet your needs. If the first two facilities of your choice do not offer a bed, Medicare guidelines require the hospital to send your information to all facilities within a 50-mile radius. Any offer from these other facilities should be seriously considered as there is a risk that insurance will not continue to pay for hospitalization once you are ready for discharge.

**Should I contact the SNF myself?**

Because each SNF receives many bed requests, you can bring your name to the attention of the facility’s admission coordinator by contacting them directly. When contacting a facility make sure to ask if any short-term beds are available. The facility will need to know the discharge plan when rehab is completed. If transition to a long-term care bed is expected, they will ask what the plan is for payment.

**What happens after a facility offers a bed?**

As soon as a facility offers a bed, the case manager/social worker will notify the patient/family and the doctor will determine the day of discharge. The patient’s family must complete paperwork at the facility before patient transfer. On the day of
discharge, the healthcare team will prepare hospital documents and arrange for patient transportation. The patient and/or family should be notified of the scheduled time for transport to the facility.
Statewide Brain Injury Support Groups

Aiken: Central Savannah River Area Support Group
Meeting Place: Vincent Village in North Augusta in the Club House
Address: 218 West Five Notch Road, North Augusta, SC
Meeting Time: 1st Monday of each month, 6:00 p.m. – 7:30 p.m.
Contact Person: Les Paul Morgan- 866-793-3407 or 803-279-9611
Contact Person: Cyndy Milstead-Anzcek- 803.279.9611

Anderson, Oconee, Pickens (AOP) Brain Injury Support Group and Recreation Group
*Website: www.aopibi.weebly.com
Support Group Meeting Place: Anderson County Disabilities and Special Needs Board
Address: 212 McGee Road, Anderson, SC
Time: 2nd Monday of each month, 6:00 p.m. – 7:30 p.m.
Recreation Group Meeting Place: AnMed Health Rehab. Hospital
Address: 1 Springback Way, Anderson, SC
Time: Every Monday, 11:00 a.m. – 1:00 p.m.
Contact Person: Candy Jones- 864-260-4529
Contact Person: Richard Dusbos- rmdusbos@gmail.com

Brain Injury Support Group of the Grand Strand (Myrtle Beach)
*Website: www.hcsdn.org/HASCIewsBI.html
Meeting Place: HASCI (Head and Spinal Cord Injury) New Horizons Center
Address: 150 Waccamaw Medical Park Court, Conway, SC
Time: 3rd Thursday of each month, 12:00 p.m. (pot luck lunch & meeting)
Contact Person: Ellen Leftwich- 843-349-7250

Brain Matters Support Group (Greenwood)
Meeting Place: United Way, Rotary Room
Address: 929 Phoenix Street, Greenwood, SC
Meeting Time: 3rd Thursday of each month, 12:00 p.m. – 1:30 p.m.
Contact Person: Kristy Lawson- 864-554-3607

Columbia Brain Injury Support Group
Meeting Place: HealthSouth Rehabilitation Hospital
Address: 2935 Colonial Drive, Columbia, SC
Time: 1st Thursday of each month, 6:00 p.m. – 7:30 p.m.
Contact Person: Maris Burton- 803-331-6383
Contact Person: Colleen Coco- 803-788-6679

Greenville Brain Injury Support Group
*Facebook Page: www.facebook.com/gdscnbhasci
Meeting Place: HASCI Resource Center
Greenville County Disabilities and Special Needs Board
McAlister Square, Suite B-6
Address: 225 S. Pleasantburg Drive, Greenville, SC
Meeting #1: Survivor, Family, and Friends
Time: 1st Tuesday of most months, 7:00 p.m. – 8:30 p.m.
Contact Person: Anne and Richard Medlock
Phone: 864-230-7821 or 864-230-7820
Meeting #2: Caregivers/Parents Group
Time: 3rd Tuesdays in March, June, September, and November, 7:00 p.m. – 8:30 p.m.
Contact Person: Anne or Richard Medlock (see contact info above) or Kay Brooks- 864-679-2400, x3711

Hartsville Brain Injury Support Group
Meeting Place: Hartsville Memorial Library
Address: 147 W. College Avenue, Hartsville, SC
Time: 2nd Tuesday of each month, 2:00 p.m. – 4:00 p.m.
Contact Person: Danny Weaver- 843-861-5413

Spartanburg-Lyman Brain Injury Support Group
Meeting Place: Bryant Center
SC Vocational Rehabilitation Department
Address: 180 Groce Road, Lyman, SC
Meeting Time: 2nd Tuesday of each month, 6:30 p.m. – 8:00 p.m.
Contact Person: Tanya Lambert- 864-249-8048 or 864-249-8030
Contact Person: Nickole Gilliam- 864-249-8043 or 864-249-8030

Trident Head Injury Support Group (Charleston)
Meeting Place: HASCI Community Opportunities
Drop-In Center - Westwood Plaza
Address: 1812 Rittenberg Blvd., Suite 6, Charleston, SC
Time: 1st Tuesday of each month, 7:00 p.m. – 8:30 p.m.
Contact Person: Marsha Mikell- 843-881-1214

Please call the contact person before attending your first support group meeting.
Groups may occasionally change a meeting time or location. Thank you!
Headaches after Traumatic Brain Injury

Headache is one of the most common symptoms after traumatic brain injury (often called “post-traumatic headache”). Over 30% of people report having headaches which continue long after injury.

Why are headaches a problem after brain injury?

Headaches after TBI can be long-lasting, coming and going even past one year. Headaches can make it hard for you to carry out daily activities or can cause you to have more difficulty thinking and remembering things.

Why do headaches happen after brain injury?

Right after a severe TBI, people may have headaches because of the surgery on their skulls or because they have small collections of blood or fluid inside the skull.

Headaches can also occur after mild to moderate injury or, in the case of severe TBI, after the initial healing has taken place. These headaches can be caused by a variety of conditions, including a change in the brain caused by the injury, neck and skull injuries that have not yet fully healed, tension and stress, or side effects from medication.

What are some typical kinds of headaches after TBI?

Migraine headaches

These kinds of headaches happen because an area of the brain becomes hypersensitive and can trigger a pain signal that spreads out to other parts of the brain (like the ripples that spread out after you drop a pebble in water). These headaches typically have the following features:

- Dull, throbbing sensation, usually on one side of the head.
- Nausea or vomiting.
- Light and sound sensitivity.
- Pain level rated as moderate to severe.
- You might get a “warning” signal that a migraine is coming on, such as seeing spots or bright lights. This is called an “aura.”

Tension-type headaches

These headaches are associated with muscle tension or muscle spasms and stress. They usually have the following features:

- Tight, squeezing sensation, often around the entire head or on both sides.
- Pain level rated as mild to moderate.
- Occur later in the day.

Cervicogenic headaches
This type of headache can occur when there has been some injury to the muscles and soft tissues in the neck and the back of the head. Many nerves that are located in the tissues and bones of the neck have branches that travel to the skull and scalp and can result in head pain. This type of headache usually has these features:
- Often start in the neck, shoulders and back of the head, and sometimes travel over the top of the head.
- Neck movement or positioning can make the pain worse.
- These headaches are not usually associated with nausea and can range from mild to severe.

Rebound headaches
Sometimes the very medicines used to treat headaches can actually cause headaches. When pain medicines are taken daily on a regular schedule, missing one or two doses can result in a headache.

You also can develop a rebound headache if you decrease the amount of caffeine you use. For example, if you normally drink a lot of coffee, tea or energy drinks but don’t get your usual amount, you may get a headache.

Other facts about headaches
Although there are many other types of headaches, these are the most frequent. It is not unusual for someone to have two different types of headache. For certain headaches like migraine, a family history is common.

Should I worry about having a headache?
Most headaches are not dangerous. In the first few days after a concussion or head injury, a person should see a health care professional experienced in treating persons with brain injuries if the following occurs:
- Your headache gets worse.
- You have nausea and/or vomiting with a headache.
- You develop arm or leg weakness or problems speaking along with a headache.
- You have increasing sleepiness with headache.

Do I need special tests to diagnose a headache?
In the first few days after a head injury, doctors will often order a CT scan of your brain to make sure there is no bleeding in your head. After that, a brain scan or other test is rarely needed in order to diagnose a headache accurately.

Usually, the health care provider will rely on your history and symptoms to sort out what kind of headache you are having and how to treat it.

What can be used to treat a headache after TBI?
This will depend on each individual case. It’s important to discuss your headaches with your doctor and to keep track of headaches and your response to treatment. Many people use a headache diary to help them do this.

Lifestyle changes to help prevent headaches
The first steps in treating any type of headache don’t involve drugs or other therapy. Many times, lifestyle factors can trigger headaches or make headaches worse. Making simple changes can often make a big difference in whether or not headaches occur. Try to:
- Get enough sleep.
- Get daily exercise. Aerobic exercise such as walking and good stretching often help to prevent headaches by improving sleep and decreasing triggers. If a headache is worsened by any particular exercise, check with your health care provider.
- Avoid caffeine.
- Avoid certain foods that may trigger a headache, like red wine, monosodium glutamate (MSG, a common food additive) or certain cheeses.
Avoid taking pain medicines on a daily basis unless your health care provider prescribes it.

Common types of treatment for occasional headaches include:

- Over-the-counter pain medicines like acetaminophen (Tylenol®) or ibuprofen.
- Prescription medicines for migraine headache like sumatriptan (Imitrex®).
- Relaxation therapy/meditation.
- Biofeedback therapy.
- Stretching and self-massage.
- Acupuncture.
- Local injections (numbing medication or steroids, or for example) to muscles, nerves or joints of the cervical spine.
- Therapeutic massage.
- Heat or ice packs.

Treatments for recurrent headaches that happen more than twice a week

Headaches that occur frequently may require a prescription from your physician. The following medications may be used to treat headaches following TBI:

- Antidepressants.
- Antiseizure medicines (like gabapentin, also called Neurontin®).
- Certain blood pressure medication called beta-blockers (like propranolol).
- Botulinum toxin (Botox) injections.

References


Source

Our health information content is based on research evidence whenever available and represents the consensus of expert opinion of the TBI Model System directors.

Authorship

Headaches after Traumatic Brain Injury was developed by Kathleen R. Bell, MD, Jeanne Hoffman, PhD, and Thomas Watanabe, MD, in collaboration with the University of Washington Model Systems Knowledge Translation Center.

Disclaimer

This information is not meant to replace advice from a medical professional. You should consult your health care provider regarding specific medical concerns or treatment.
One of the problems that can occur after a traumatic brain injury (TBI) is seizures. Although most people who have a brain injury will never have a seizure, it is good to understand what a seizure is and what to do if you have one. Most seizures happen in the first several days or weeks after a brain injury. Some may occur months or years after the injury. About 70-80% of people who have seizures are helped by medications and can return to most activities. Rarely, seizures can make you much worse or even cause death.

What are seizures?

Seizures happen in 1 of every 10 people who have a TBI that required hospitalization. The seizure usually happens where there is a scar in the brain as a consequence of the injury.

During a seizure there is a sudden abnormal electrical disturbance in the brain that results in one or more of the following symptoms:

- Strange movement of your head, body, arms, legs, or eyes, such as stiffening or shaking.
- Unresponsiveness and staring.
- Chewing, lip smacking, or fumbling movements.
- Strange smell, sound, feeling, taste, or visual images.
- Sudden tiredness or dizziness.
- Not being able to speak or understand others.

Symptoms of a seizure happen suddenly, and you are unable to control them. Seizures usually last only a few seconds or minutes, but sometimes continue for 5 to 10 minutes. You may have a bladder or bowel accident or bite your tongue or the inside of your mouth during a seizure. After the seizure, you may be drowsy, weak, confused or have a hard time talking to or understanding others. After a severe seizure, one that lasts longer than 2 minutes, it may be harder for you to stand, walk or take care of yourself for a few days or even longer.

Conditions that could increase the risk of having a seizure include:

- High fever.
- Loss of sleep and extreme fatigue.
- Drug and alcohol use.
- Chemical changes in the body such as low sodium or magnesium, or high calcium.
Seizures after Traumatic Brain Injury

Seizures and TBI

- Early post-traumatic seizures: A seizure in the first week after a brain injury is called an early post-traumatic seizure. About 25% of people who have an early post-traumatic seizure will have another seizure months or years later.

- Late post-traumatic seizures: A seizure more than seven days after a brain injury is called a late post-traumatic seizure. About 80% of people who have a late post-traumatic seizure will have another seizure (epilepsy).

- Epilepsy: Having more than one seizure is called epilepsy. More than half the people with epilepsy will have this problem for their whole lives.

The cause of your brain injury can help doctors figure out how likely you are to have seizures.

- 65% of people with brain injuries caused by bullet wounds have seizures.

- 20% of people with ‘closed head injuries’ that cause bleeding between the brain and the skull experience seizures. A ‘closed head injury’ means the skull and brain contents were not penetrated in the injury.

- Over 35% of people who need 2 or more brain surgeries after a brain injury experience late post-traumatic seizures.

- Over 25% of people with bleeding on both sides of the brain, or who have a blood clot that must be removed by surgery, experience late post-traumatic seizures.

Medications to treat seizures

Medications that are used to control seizures are called antiepileptic drugs (AEDs). These drugs may be used for other problems, such as chronic pain, restlessness, or mood instability. You and your doctor will decide on which drug to use based on your type of seizures, your age, how healthy you are, and if you get any side effects from the medications. Side effects of AEDs usually improve after you’ve been taking the medication for 3-5 days.

Some common side effects of AEDs are:

- Sleepiness or fatigue.
- Worsening of balance.
- Lightheadedness or dizziness.
- Trembling.
- Double vision.
- Confusion.

Blood tests may be needed to make sure you are getting enough of the medication and to make sure the drug isn’t causing other problems. Although these drugs rarely cause birth defects in newborns, tell your doctor if you are pregnant or may become pregnant.

Sometimes your doctor will prescribe two or more of these medications to stop your seizures. Some common AEDs are:

- Carbamazepine (also known as Tegretol).
- Lamotrigine (also known as Lamictal).
- Levitiracetam (also known as Keppra).
- Gabapentin (also known as Neurontin).
- Oxcarbazepine (also known as Trileptal).
- Phenobarbital.
- Phenytoin/fosphenytoin (also known as Dilantin).
- Pregabalain (also known as Lyrica).
- Topiramate (also known as Topamax).
- Valproic acid or valproate (also known as Depakene or Depakote).
- Zonisamide (also known as Zonegran).

What if the medications do not work?

If your seizures continue even after trying medications, your doctor may refer you to a comprehensive Epilepsy Center for more tests and to be seen by special seizure doctors called epileptologists or neurologists specializing in epilepsy. At the comprehensive Epilepsy Center, the doctors may do brain wave tests and take a video of you during one of your seizures to help figure out what is causing the problems. This may help your doctor decide what drug will work best, and to see if other types of treatment will help with the problems you are having.

The websites of the Epilepsy Foundation of America (www.efa.org) or the American Epilepsy Society (www.aesnet.org) can tell you about the nearest comprehensive Epilepsy Center.
Safety Issues

In most states, if you have had a seizure you cannot drive and you must notify the department of motor vehicles (DMV). Usually you won’t be able to return to driving for a period of time, or until your seizures have been completely stopped. Laws vary from state to state regarding how long after a seizure you must not drive.

Other things you should do to stay safe if your seizures have not stopped:

- Always have someone with you if you are in water (pool, lake, ocean, bath tub).
- Don’t climb on ladders, trees, roofs or other tall objects.
- Let people you eat with know what to do in case you have a seizure and start choking.

What your caregiver should do if you are having a seizure

Family members or caregivers should watch closely to see what happens during a seizure so they can explain it to medical professionals. They should make a diary describing the date, time of day, length of time, and description of each seizure. Your doctor will need this information about your seizures and the drugs you are taking to control them.

The majority of seizures are short and do not result in significant injuries. However, it is important for your caregivers to know what to do to keep you from hurting yourself.

What to do for someone having a seizure:

- Loosen tight clothing, especially around the neck.
- Make sure the person does not fall. Hold the person steady if he or she is in a chair, couch or bed. If the person is standing, get him or her to the ground safely.
- Turn the person and his or her head to the side so that anything in the mouth, even spit, does not block the throat.
- It can be dangerous to put anything in the mouth as you can get bitten.
- If you know CPR, check the heart beat in the neck. Start CPR if there is no pulse. Call 911.

- Listen for breathing at the mouth and extend the neck if breathing is difficult. If there is no breathing, start CPR by sealing your lips over the person’s mouth and breathing 2 quick breaths. Continue breathing every 5 seconds unless the person starts breathing without help. Call 911.
- If this is the first seizure after TBI, call the person’s doctor for advice.
- If the seizure does not stop after 3 minutes, call 911.
- If the seizure stops within 3 minutes, call the person’s doctor.
- If the person does not return to normal within 20 minutes after the seizure, call 911.

For More Information

The Epilepsy Foundation of America
Phone: 1-800-332-1000
Web: www.efa.org

Brain Injury Association of America
Phone: 1-800-444-6443
Web: www.biausa.org

References


Brain Trauma Foundation and American Association of Neurological Surgeons: Management and prognosis of severe traumatic brain injury 2000; pp 159-165

Disclaimer

This information is not meant to replace the advice from a medical professional. You should consult your health care provider regarding specific medical concerns or treatment.

Source

Our health information content is based on research evidence whenever available and represents the consensus of expert opinion of the TBI Model System directors.

Authorship

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