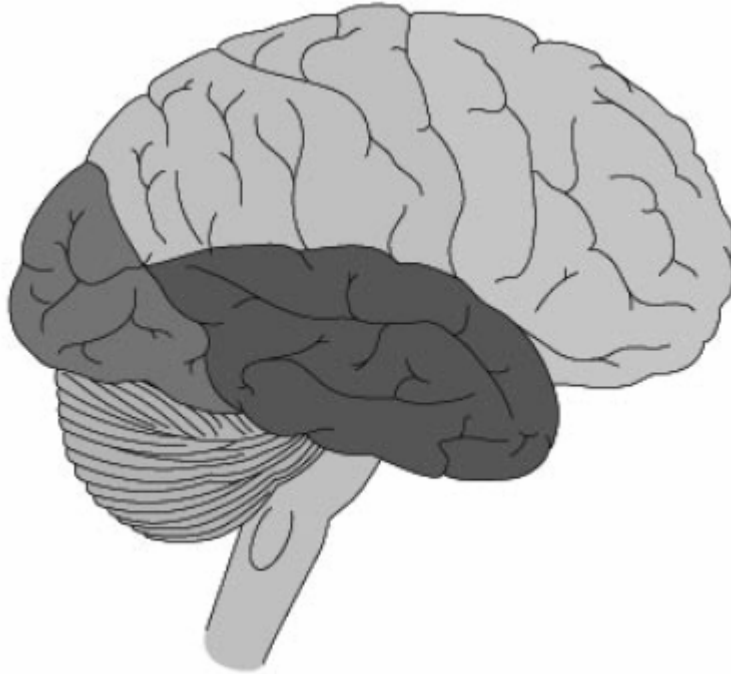


What to Expect



***After a
Brain Injury***

*“There is no brain injury
too trivial to ignore, nor too
serious to despair of”*

Hippocrates

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Introduction

Brain injury affects who a person is, the way he/she thinks, acts and feels. A brain injury can change life in just a matter of seconds. Recovering from a brain injury can take a few months to years. It could be a lifetime process, requiring major changes to daily living activities. However with the assistance from your health care team, you will find new skills and information to help you with the recovery process.

We have written this booklet to provide you with some of the information you will need to know as a family member, a person with a brain injury, or as a friend.

First we suggest some things to keep in mind while you read this booklet:

- Brain injuries affect every person in your family.
- No two brain injuries are exactly the same.
- The effects of a brain injury will vary from person to person.

“Information makes the intimidating....

simple,

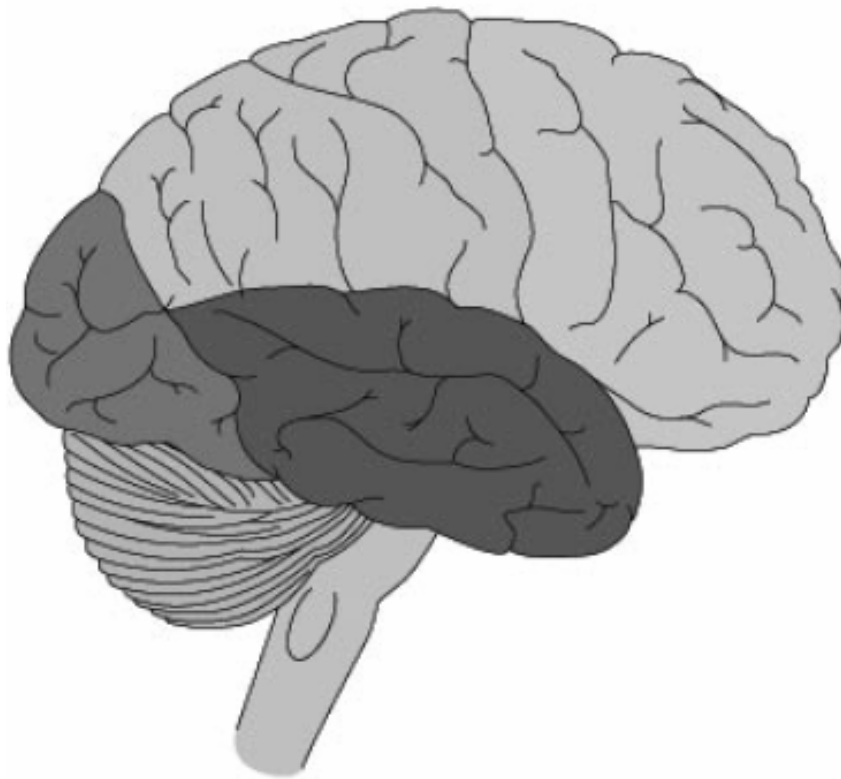
the overwhelming...

tolerable.

There is much fear in the unknown.”

Dayla Maisey

Brain Injury



What is a Brain Injury?

Acquired Brain Injury (ABI) is caused by traumatic and non-traumatic events that injure the brain.

Traumatic brain injury (TBI) can happen when a person hits his/her head or is hit on the head, or when the brain is thrown around within the skull by strong forces. Common causes of TBI include motor vehicle crashes, falls, or assaults.

Non-traumatic brain injury is caused by illness such as meningitis and encephalitis; anoxic events - whereby oxygen flow to the brain is disrupted as in strokes, aneurysms or during cardiac arrest and near drowning. The brain can also be damaged from tumours, hydrocephalus and substance abuse (Ontario Brain Injury Association, 2005).

Brain injuries affect each person differently, and there is not always a predictable pattern of problems after a brain injury. Brain injury can be hard to understand because the injury is hard for other people to see. It is still a real injury, and just like a person with a broken leg will need crutches to help with his/her recovery, the person with a brain injury will need help to develop ways to compensate for the deficits during recovery. Just like a broken leg needs time to heal, so does an injury to the brain. Things do improve, but it takes time, patience and perseverance.

What About Recovery?

This is a hard question to answer. Every injury is different, and every person recovers differently. Recovery depends on the location of the injury and the seriousness of the injury. It can also depend on a person's medical history and age.

Symptoms are a part of the normal recovery process. They are not necessarily signs of permanent brain damage or medical complications. The rate at which symptoms resolve can be as short as a few weeks, or the symptoms may persist for years.

The injury can result in diffuse (widespread) damage, and therefore cause a wide range of deficits and symptoms. This type of diffuse injury is called diffuse axonal injury (DAI). It happens when there is stretching and shearing of the axons, which are parts of the nerve cells. The brain floats in fluid within the skull. It is similar in consistency to Jell-O. In accidents where there is an abrupt stop, such as in a

motor vehicle collision, the brain can be thrust forward and backward against the inside of the skull. This can cause a contusion (bruise) to the part of the brain that hits the skull, but it also results in the more diffuse injury to other nerve cells in the brain.

A big part of recovery involves learning to understand the injury and the impact the injury has had on the person's life. It will be important to work with the health care team to learn new skills and new ways to compensate for the effects of the brain injury.

Levels of Severity

Health care professionals often classify a head injury as mild, moderate, or severe. This gives the health care team an idea of the amount of improvement a person might make.

The most common way of classifying severity is based on the Glasgow Coma Scale. This scale is used at the time of the injury. It looks at how well a person can follow directions, if he/she can answer questions by talking, and open his/her eyes when spoken to. The highest (best) score a person can get is 15, the lowest score is 3.

The levels of severity are based on this scale:

A **severe brain injury** refers to a Glasgow Coma Scale score of 8 or less.

A **moderate brain injury** refers to a Glasgow Coma Scale score between 9 and 13.

A **mild brain injury** refers to a Glasgow Coma Scale score that was not less than 13.

It is important to know that a person with a mild injury can benefit from the help of a health care team, just as much as a person with a severe injury. Regardless of the severity of the injury, a person can have symptoms that can continue to affect his/her life for many years.

Levels of Recovery

The stages of recovery from a brain injury can be described by using an 8-stage scale called the Rancho Los Amigos Scale of Cognitive Function. You may have already heard or read about this scale. It describes 8 stages of recovery after a brain injury. Please remember that this is just a guide. People don't always move clearly from one level to the next. They might seem to fit the descriptions of two levels at the same time. Lastly, they may not necessarily progress through all of the stages. People who come to the Nova Scotia Rehab Centre are usually at Level 5 or above.

Level 1: No Response / Total Assistance

At this stage, the person seems like he/she is in a deep sleep. The person is unable to respond to the environment. Talk to the person in a soothing voice, hold his/her hand, and try to be comforting and reassuring. This stage is very hard on family and friends, as you wait to find out what is going to happen next.

Level 2: Generalized Response / Total Assistance

The person may start to respond to sounds or to touch. These responses are inconsistent. He/she still seems to be asleep most of the time. Continue to talk to the person, but do not provide too much stimulation, as rest is very important.

Level 3: Localized Response / Total Assistance

The person seems more alert and may even begin to respond to simple commands. He/she may begin to say a few words. Continue to provide reassurance that he/she is safe and secure. Provide orientation to what day it is and why he/she is in the hospital.

Level 4: Confused and Agitated / Maximal Assistance

This stage can be upsetting. It is marked by periods of unusual, often aggressive behavior. The person may become agitated or verbally abusive for no apparent reason. He/she may try to crawl out of bed, wander off, and resist treatments. Memory may be limited to things that happened before the injury. Conversations may be confused, and the person may not be reliable to tell you what is going on. Attention span is very short. He/she will require constant cueing to carry out even simple self-care activities. Outbursts are most likely in response to the confusion being experienced.

Suggestions for Level 4

- The goal is to decrease agitation and maintain safety.
- Use calm, soft speech and slow, simple words to lessen the tendency for agitation.
- Limit the number of distractions in the room.
- Provide structure.
- Remove distractions such as TV or radio.
- Attempt to correct an inappropriate response, but do not argue the point. If confusion and agitation is ongoing, do not try to rationalize with the person. Give him/her time to relax. Provide human contact and soothing reassurances. Try to remember not to take any of the comments and behaviors personally.

Level 5: Confused – Inappropriate / Maximal Assistance

The person is alert and can follow simple directions with some consistency. He/she is easily distracted and requires repeated refocusing to concentrate on activities. Short-term memory is still limited. He/she may use objects inappropriately if not reminded of their proper use. The person may be able to do routine things such as dressing and eating, but is unable to learn new skills or process new information. He/she can probably have a social conversation if provided with cues. The person may confabulate (make things up) when he/she doesn't know the answer to something.

Suggestions for Level 5

- Continue to help him/her to get back in touch with the world: talk about family and friends, and the things done during the day. Try to have information recalled, providing hints to stimulate memory. For example, ask immediately after breakfast what he/she ate. Encourage success with praise. Try not to ask too much of a person, as this can be frustrating. Don't ask questions that you know he/she can't answer.
- Use photo albums as a way of reviewing family and friends.
- Some people will be able to play simple card games at this stage.
- Try to keep routines consistent to help organize the person.
- Discuss any problems he/she is having related to the brain injury honestly and matter-of-factly.
- Speak in a calm voice and always remember to address him/her in an age-appropriate fashion.

Level 6: Confused – Appropriate / Moderate Assistance

The person's speech makes sense, and simple directions are followed with consistency. He/she may be able to do such routine things as feeding and dressing but may need cueing to start and stop these tasks. Learning new activities is still difficult due to continued short-term memory deficits. Attention span expands to about 30 minutes. He/she will be unaware of impairments and also unaware of safety risks.

Suggestions for Level 6

- Work towards increasing independence during this stage. Gradually decrease the amount of help you provide for simple activities.
- Offer games and crafts that are more mentally challenging but not frustrating.
- Ask to have familiar tasks such as making coffee, changing money, or washing clothes described in steps.
- Be sensitive to tolerance levels and signs of fatigue. Keep activities at a moderate pace, and always allow time for rest

Level 7: Automatic – Appropriate / Minimal Assist

The person is able to do usual daily routines automatically, with little or no confusion. He/she has limited recall of what was accomplished and lacks insight into the extent of remaining problems. Judgement and problem solving may be impaired. The person may not be aware of other people's needs and feelings. He/she is not able to plan realistically for the future and may overestimate abilities. The ability to learn new information is improved, but it occurs at a slower rate than before the injury. For safety, some supervision is needed. Some interest in social and recreational activities is regained.

The major goals of this and the next level of recovery are to promote independent skills so that supervision can be safely withdrawn.

Suggestions for Level 7

- During this stage, "real-life" activities of increasing complexity such as shopping or using a telephone directory and/or map can be attempted.
- Situations of daily living at home and in the community should be discussed. Use of judgment skills should be emphasized.
- Patience during interactions is needed as the processing of new information may be slowed.

Level 8: Purposeful and Appropriate / Stand-by Assistance

Memory for past information is good. Short-term memory may remain somewhat impaired but is improving. Attention span is also improved. The ability to start and carry out complex tasks is starting to get better. The need for supervision of activities is decreased. Some decreased ability to reason, tolerate stress, or use good judgment in unusual situations may be noticed. Social, emotional and intellectual skills may continue to be less than before the injury, but are good enough to function successfully as a member of society. He/she may still seem self-centered.

Suggestions for Level 8

- Involvement in home, school, or job within the person's physical and intellectual capabilities may be encouraged. Of course, these decisions should always be made in consultation with the person's doctor.
- Responsibilities for one's own needs can be resumed.
- Complex tasks such as meal planning and preparation, organizing chores into a daily routine, and planning leisure activities can be carried out independently or with standby supervision.
- The person should be encouraged to continue to utilize aids such as memory books or reminder lists to assist him/her with accomplishing goals.

Adapted from the Rancho Los Amigos Levels of Cognitive Functioning (1998).

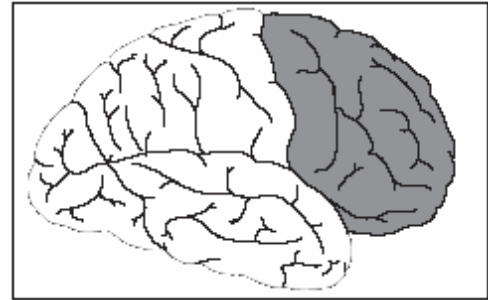
During these later stages, counseling may be suggested to assist the individual in gaining insight into the changed levels of functioning that he/she may be having, and to develop coping strategies if deficits make a return to previous school or work status unlikely.

High-level activities such as driving or returning to work should not be started without talking to the doctor.

Areas of the Brain

Frontal Lobes

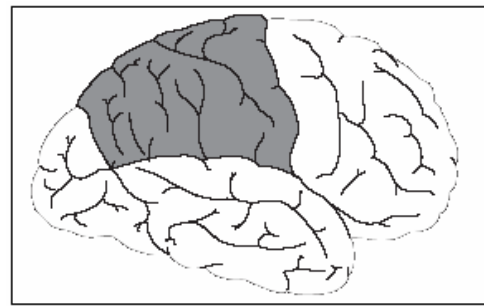
The frontal lobes are at the front of the brain, just behind your forehead.



Function	Possible Effects of Brain Injury
<ul style="list-style-type: none">• Self-awareness• Personality• Planning• Organization• Control of behaviour• Emotional response• Expressive language	<ul style="list-style-type: none">• Difficulty making decisions• Difficulty focusing attention on tasks• Easily distracted• Difficulty problem solving• Stubborn• Personality changes• Difficulty maintaining socially appropriate behaviour• Perseveration – repeating the same action or words over and over without realizing it• Difficulty planning tasks in the right order• Mood swings• Word finding problems

Parietal Lobes

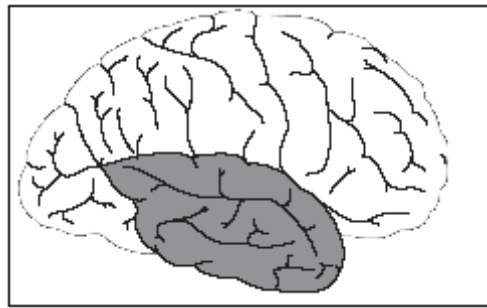
The parietal lobes are located on both sides of the head, near the top and towards the back.



Function	Possible Effects of Brain Injury
<ul style="list-style-type: none">• The integration of information about sight• Touch• Body awareness• Verbal comprehension	<ul style="list-style-type: none">• Difficulty with hand-eye coordination• Inability to recognize touch sensation on the opposite side of the body <p>Right side</p> <ul style="list-style-type: none">• Difficulty drawing objects• Lack of awareness of certain body parts <p>Left Side</p> <ul style="list-style-type: none">• Difficulty naming objects• Difficulty doing math calculations• Difficulty writing words

Temporal Lobes

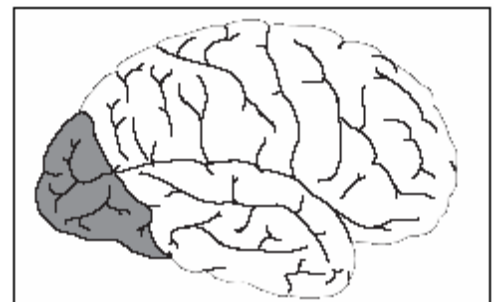
The temporal lobes are located on both sides of the head, near the ears.



Function	Possible Effects of Brain Injury
<ul style="list-style-type: none"> • Hearing • Perception • Memory • Language 	<ul style="list-style-type: none"> • Memory problems • Changes in sexual interest • Aggressive behaviours <p>Right side</p> <ul style="list-style-type: none"> • Difficulty recognizing faces • Difficulty understanding spoken words • Difficulty recognizing music • Persistent talking <p>Left side</p> <ul style="list-style-type: none"> • Inability to read or understand what someone is saying

Occipital Lobes

The occipital lobes are located at the back of the head.



Function	Possible Effects of Brain Injury
<ul style="list-style-type: none"> • Visual perception (Images coming from our eyes go directly to the visual cortex in the occipital lobes) 	<ul style="list-style-type: none"> • Defects in vision (visual field cuts) • Difficulty with locating objects in environment • Difficulty recognizing colors • Visual illusions - inaccurately seeing objects • Word blindness - inability to recognize words • Difficulties with reading and writing

Common Effects of a Brain Injury

Brain injury can change the way a person thinks, acts and moves. The changes can be grouped into 3 categories: cognitive, behavioural and physical. It is important to keep in mind that all of these changes don't happen to everyone. As people progress through recovery they may display these changes in varying degrees. These changes are not necessarily permanent; often they can improve with therapy and the passing of time. For example, a person may be aggressive initially but this may improve. The following sections of this booklet will give a brief description of each of these changes, along with suggestions for addressing them and compensating for them.

1. Cognitive means thinking, so cognitive changes affect the way a person thinks. There are many different cognitive changes that can occur after a brain injury. Cognitive changes include:

- Memory problems
- Decreased attention span
- Poor judgment and difficulty solving problems
- Problems communicating
- Problems with executive functioning

2. Behaviour changes can be very difficult for the survivor, family and friends to cope with. Behavioural changes include:

- Agitation
- Aggression
- Impulsivity
- Lability
- Lack of motivation
- Socially inappropriate behaviour
- Depression
- Sexual changes

3. Physical changes include:

- Activities of daily living
- Bowel or bladder problems
- Problems with movement
- Spasticity
- Fatigue
- Swallowing problems
- Nutrition
- Weight
- Vision problems
- Changes to the skin
- Seizures

Cognitive Effects



Memory Problems

Memory problems are one of the most common effects after a brain injury. The person with a brain injury may forget what he/she did during the day, who came to visit, or who he/she talked to on the phone. Someone may need to be with him/her most of the time to keep track of what needs to get done during the day. Recent research has shown that it is best to help the person find ways to remember (compensate for the problem), rather than quiz the person to remember the facts. Providing the person with the right answer from the start helps to prevent mistaken guesses. When the right answer is not given and the person is forced to guess or find the answer, errors are likely to happen. When these wrong answers are repeated, the person may learn the wrong answer instead of learning the correct information.

The person's memory may appear better sometimes than others. This is especially true when he/she is not required to consciously think of the answer and can answer automatically instead.

Some things that may help:

- Memory books or journals to write down the events of the day and keep track of appointments.
- A written daily schedule of activities.
- Calendars – mark off the days as they pass.
- Alarms / clocks.
- Keeping things in the same place.
- Following the same routines every day.
- Repetition.
- Pictures with names of friends and family members.

The health care team working with you family member can help to decide which strategies are the best ones for him/her to use.

Attention or Concentration

Attention involves being able to select what is important in the environment and being able to pay attention to it. It also involves being able to stay focused on what is important. A person with a head injury may be easily distracted and may have a hard time paying attention to things or to people. He/she may be unable to follow a conversation, or the plot of a TV show or book.

Some things that may help:

- Decrease the amount of distractions by limiting visitors. Turn off the TV if you are trying to talk to the person.
- Give the person only one activity to do at a time – limit choices.
- Break tasks down into simple steps.
- Allow enough time for the person to do things. Take it slow.
- Redirect the person back to the task at hand as needed.
- Repeat information as needed.
- Use a normal tone of voice. Raising your voice will not help him/her concentrate any better.
- Ensure that the person is getting adequate rest periods during the day – being tired makes it harder to concentrate.
- Activities that require the person to be alert should be planned when he/she has the most energy. For many people this time is earlier in the day, or after an afternoon nap.

Judgement / Problem-solving / Reasoning

The person with a brain injury may have difficulty with judgement and problem solving. The person might find it hard to consider all the details of a situation and to figure out the right way to handle the situation.

Solving a problem requires being able to look at many options, weigh the pros and cons and be able to choose the best way to proceed. After a brain injury, a person may make decisions without thinking through all the details. It may be hard for him/her to think of all the possibilities.

Once the person has a solution to the problem, it may be hard to think of another solution – even if the first one doesn't work or isn't safe. Poor judgement may lead to poor decision-making. A person's ability to make good and safe decisions will affect the level of supervision that person needs to go about his day-to-day activities.

Some things that may help:

- Break things down into smaller steps.
- Present one idea at a time.
- Give the persons 2-3 choices instead of asking broad questions.

- Provide supervision and guidance.
- Allow extra time for problem solving.
- Allow the person to be involved in decision-making.
- Write down solutions to common problems so the person with the brain injury can review them easily.

Communication (Speech and Language)

Normal communication involves many complex brain activities. If the injury to the brain affects any of the parts that control communication, these complex activities may not be able to happen. A person with a brain injury may have changes in the ability to talk, listen, read, or write.

Different types of communication problems can occur. The person might not be able to understand (comprehend) what is being said. If this is the case the person may have trouble following directions or conversations, but may be able to understand when more information is given.

The person may have difficulty expressing what he/she wants to say, or finding the words to use. He/she may be able to describe the item but may not be able to name it. The person may try to speak using words that have no meaning.

Sometimes the problem is with the physical process of making the sounds of speech. The messages between the brain and the structures that control the process of speaking (such as the tongue, lips, larynx) can also be affected by injury to the brain. This can result in slurred, hard to understand speech, or a weak voice.

Decreased concentration and memory can also affect the ability to communicate.

Some things that may help:

- Follow the specific suggestions from the speech-language pathologist.
- Decrease distractions and background noises when you are trying to communicate.
- Talk slowly and repeat things if needed.
- Speak in clear simple sentences.
- Do not change topics too quickly.
- Speak about things that are familiar to the person.

- Allow time for the person to try to communicate.
- Try not to answer for the person, or to finish his/her sentences. If a person is having difficulty, you can help by giving a cue to help find the right word.
- If the person gets sidetracked or repeats information, gently interrupt and explain that you are having trouble following the conversation, or that you have heard the information before.
- Recognize that communication problems are upsetting and frustrating.

Problems with Executive Functioning

The term “executive function” refers to the ability to organize thoughts and control our thinking and behaviour needed to manage the day-to-day functions of one’s life. Planning, organizing, self-monitoring and controlling behaviour are all examples of executive functions. Damage to the frontal lobes can affect these skills.

After a brain injury, a person may have difficulty starting tasks. The ability to start a task is called initiation. It is important to recognize that the *brain injury*, rather than a lack of motivation is responsible for the difficulty of starting a task.

A person with a brain injury may have difficulty with managing time, completing a task that was started, keeping track of money, following directions, or gathering necessary items before leaving the house (such as a wallet). These can all be the result of problems with planning and organizing.

A person with problems in self-monitoring may not be able to notice or correct mistakes. Poor self-monitoring skills may also lead to difficulty with a person managing (regulating) behaviour.

Some things that may help:

- If the person is aware that he/she is having difficulty, encouragement and direct feedback can be given to help the person change behaviour.
- Provide structure and consistency – use a day planner or organizer.
- Breaking down any task into specific tasks – use checklists.

Behavioural Effects



Restlessness and Agitation

Agitation is a loss of control over behaviour. Agitation is characterized by several observable actions: restlessness, pacing, inability to focus on something, standing up and sitting down over and over, constant fidgeting, and irritability. Agitation is one of the most upsetting symptoms of brain injury. Agitation is often unprovoked and unrelated to anything you have done. The feelings of confusion and disorientation that are common after brain injury can lead to agitation.

You should be aware of some of the things that can contribute to agitation. The person may have difficulty letting you know that he/she needs to use the bathroom, is hungry, in pain, or tired. Try to anticipate these needs. If a person is squirming in the chair and getting restless it may be because he/she is uncomfortable or needs to use the bathroom. Being in an unfamiliar setting can also be upsetting. It can be helpful to bring in pictures and other familiar objects from home.

Sometimes restlessness can be decreased with activity. If it is safe to do so, walking can help to use up some of this excess energy. If the person is unable to walk, you may find that taking him/her for a walk in the wheelchair will help.

Changes in routine can also be very upsetting to a person with a brain injury. Try to plan ahead, and if a change in routine is needed do your best to give the person some notice. This can be difficult, especially if you are used to being spontaneous.

It is also a good idea to give the person positive feedback when you like the way he/she is behaving.

Despite your attention to these points, the person may still become agitated. If this happens there are several things you can try to help resolve the agitation.

Some things that may help:

- Help the person feel safe and secure by remaining close by.
- Talk in a calm, soothing tone of voice.
- Try to focus his/her attention on something else. Do this in a gentle manner – don't try to rush.
- Decrease background stimuli (turn down the radio, dim the lights).
- Avoid disagreeing with the person. Correct once, but if the person insists that he/she is right try to redirect or give a neutral response.

Aggression

Aggression can be verbal or physical. Either way, aggression is upsetting and scary. It is important to remember that this is the result of the brain injury. It is the behaviour that is unacceptable, and not the person. Try your best not to take the behaviour personally. Try not to blame the person or yourself for the behaviour. Remember that outbursts are usually short-lived and the person generally returns to the way that he/she was before the upset.

Tips for handling an angry outburst:

- Stay calm. This can be very hard, especially if you are scared or upset.
- If it is possible, ignore the outburst. Reacting to the behaviour may provide the reinforcement it needs to occur again.
- Make sure that you are both safe. You may need to leave the room.
- If you need to intervene, keep your voice calm. Give simple but firm directions, such as “Don’t hit”.
- Don’t try to reason with the person at this time.
- Return when the person has calmed down. You can use this time to gently suggest a better way of handling the situation the next time.

You may be able to identify certain things or situations that seem to lead to outbursts. We call these “triggers”. When you are able to recognize particular things that lead to outbursts, you can try to avoid them or modify them if you can.

Here is an example: a person becomes upset every morning when getting ready to go to 9:00 am therapy. He/she swears at the nurse. This is the only time of day that this happens. Family reports that that before the brain injury, the person disliked being late for anything. The health care team assesses this behaviour and realizes that perhaps the trigger for the behaviour is the rush to get ready for therapy. The time of the first therapy class is moved to 10:30 am. The outbursts stop.

It usually works best to focus on the cause of the behaviour rather than consequences for behaviours. If aggressive behaviour is an issue, we will work with you and our neuropsychologist to come up with a plan for identifying the triggers and decreasing the frequency of the outbursts.

Impulsivity

Impulsivity means acting without thinking. After a brain injury, a person may do things without stopping to think about it first. A person in a wheelchair may not put the brakes on before getting into it. You may notice that he/she says things that are embarrassing and out of character. Impulsivity can lead to risk-taking behaviour, as the person is unable to make the “if - then” connection (*if I do this, then that might happen*).

Some things that might help:

- Provide reminders such as “slow down”, or “think about this for a minute”. It is better to provide reminders before the person does something that is unsafe rather than reprimanding him/her after the fact.
- Provide positive feedback for appropriate behaviour.
- Let the person know how his/her behaviour makes you feel, “It hurts my feelings when you say that to me”.
- Model self-regulation by speaking and moving slowly and purposefully.

Lability

Lability refers to a loss of control over emotions. This can occur with a frontal lobe injury. The emotional reaction may be exaggerated. The fact that the emotions are exaggerated or displayed with little reason does not mean that they are stronger than before the brain injury. Crying is the most common reaction seen with lability, but laughter may also be seen. With lability, the crying or laughing occurs for no obvious reason. Try to remember that the behaviour is not intentional.

Some things that might help:

- Don't criticize (remember it is not intentional).
- Don't dwell on the person's feelings.
- Praise the person when control of emotions is displayed.
- Try to redirect the person when labile.
- Model calm behaviour by remaining calm yourself.

Lack of Initiative or Motivation

Lack of initiative means that a person has trouble getting things started. An injury to the brain can affect the ability to plan and organize (particularly an injury to the frontal lobes). A person may have trouble starting a task. She/he might just wait until asked to do something. If asked to do a task, he/she will do it but may not do anything else unless asked. An example of this is that the person might get washed if reminded, but may not get dressed until he/she is given another reminder. A person at home may know that there are chores to do, but he/she just isn't able to get up and do them. This behaviour can be frustrating for both of you.

Some things that might help:

- Break activities down into smaller, more manageable steps.
- A tick off list may help: tick off activities as they are completed.
- Establish a daily routine.
- Provide cueing to take part in activities.
- Give the person a choice of 2 or 3 things to pick from. Don't ask "What do you want to do?" or "Do you want to do this?" He/she may say no, or may be unable to decide on something.

Morning Routine	
8:30	<input type="checkbox"/> Breakfast
9:00	<input type="checkbox"/> Wash
	<input type="checkbox"/> Put on clean clothes
	<input type="checkbox"/> Brush teeth
	<input type="checkbox"/> Brush hair

Socially Inappropriate Behaviour

Socially inappropriate behaviour can stem from a lack of inhibition (lack of self-control). This can make it hard for the person to know how to act in a social situation. He/she might ask embarrassing or personal questions. The person might get impatient waiting in a line up. He/she might talk in an overly loud voice.

Some things that might help:

- Don't call attention to the behaviour or make a big deal out of it in front of other people.
- Let the person know that this behaviour is not appropriate, but do it in a calm tone of voice. You can say something such as "Please don't talk about that here", or "Let Mary finish talking and then you can ask your question", or "It hurts my feelings when you say that".
- Try to redirect the person by suggesting something else to do or talk about.

Lack of Insight

Lack of insight means a lack of self-awareness of changes. People who survive a brain injury are often unaware of any deficits that have happened as a result of the brain injury. He/she is usually able to recognize any physical deficits, but may have a hard time believing that he/she has problems with thinking or behaviour. If the person with a brain injury has poor insight into any deficits, he/she may not even try something because he/she thinks it is stupid. The person might insist on doing something that he/she cannot safely do. Remember that this is caused by the brain injury and not by him/her trying to give you a hard time.

Some things that might help:

- Gently and simply explain what problems the person really does have.
- Use words and examples that the person can understand.
- Explain that the injury itself makes it hard for him/her to recognize deficits (problems).
- Do not argue. Try changing the subject. You could say, "Let's try this instead".

Depression

Depression is common after brain injury. It may not develop until after the person has been discharged from the hospital. Be alert for signs of depression to allow for early treatment. Sometimes it can be hard to identify depression in someone who has had a brain injury because many of the symptoms of depression are similar to the symptoms of brain injury. If you notice a change in the person's behaviour and are worried that he/she is depressed, please contact the doctor or another health professional.

Some signs that may indicate a depression:

- Sleep difficulties
- Lack of interest in things that used to be interesting
- Feelings of worthlessness
- Loss of energy
- Lack of emotions
- Changes in appetite
- Feeling like there is nothing to look forward to in life
- Thoughts or talk of suicide

Sexual Changes

Changes in sexual interest are common after brain injury. Damage to the hormonal centers in the brain, psychological responses to the brain injury, cognitive changes, and/or medications can cause these changes. Some may lose interest and others have increased interest.

It is not common for there to be a solely physical reason for changes in sexual function. Psychological changes such as self-image and depression may be present. Feelings of loss and unattractiveness can occur. This requires acceptance, reassurance, and adjustment by the person with brain injury and his/her partner. The sexual relationship will need exploration. The partner may need to discover new roles to adjust to the changes in personality and confidence. Medications to prevent seizures and aggression often have side effects that may impact sexual interest.

The person may become very interested in sex and be unable to distinguish what is appropriate for the situation. He/she may make sexual comments and advances toward others. The person often does not comprehend the impact of this on others. Reminding the person that it is not acceptable can often curb this behaviour. Other strategies may need to be put in place. Providing a more structured environment, removing the person from certain situations, and/or setting up sessions with support groups to help the person see the consequences of this behaviour can discourage these behaviours.

Physical Effects



Activities of Daily Living

Activities of daily living (ADLs) refer to those routine day-to-day tasks that a person does to take care of him/herself. The term includes such activities as washing, getting dressed and grooming. After a brain injury, a person's ability to do these things independently can be changed.

The ability to take part in self-care activities can be affected by many of the changes that occur after brain injury. Problems with memory, planning, sequencing, initiation, motivation, vision, perception, as well as physical changes can all impact a person's ability to do self-care tasks independently. No matter what the cause, the result may be that a caregiver will have to assume responsibility for ensuring self-care tasks are done. This can range from providing cueing for the person to do care for him/herself, or the person may need physical help to complete some or all self-care tasks. In hospital, the nursing staff will provide this assistance. If help is needed at the time of discharge, a referral will be sent to Home Care Nova Scotia.

The occupational therapist will work with the person to teach him/her ways of making self-care activities easier to complete.

Any of the cognitive and behavioural changes already discussed can make it difficult for a person to do self-care activities independently. It is also possible that there will be actual physical changes that make it difficult to care for oneself.

A person may have a variety of potential problems depending on the area of the brain affected and the extent of the injury. These can include: weakness on one side of the body, decreased coordination, spasticity, poor balance and poor mobility. These are all things that may change with therapy, time and practice.

Bladder or Bowel Problems

The usual bladder problem is incontinence. The usual bowel problem is constipation. Bowel incontinence is a less common problem.

Bladder - A brain injury may cause the signals from the brain to get confused. The person may not be able to tell when the bladder is full and may have an accident. The person may feel a need to urinate, even when he/she does not need to go. The most effective treatment is reminding (or helping) the person to go to the toilet every 2 hours. Encourage the person to try even if the person says that he/she does not have to go.

There are also medications that can be tried. It is important not to cut back on fluid intake with the hope of avoiding accidents. Adequate fluid intake can help prevent a UTI (urinary tract infection).

Bowel - Constipation is sometimes a problem, as well as incontinence of stool. A bowel routine can help. Somethings that we may try include: taking the person to the toilet at the same time every day (for many people immediately after breakfast is the best time to try), encouraging a diet high in fibre and fluid, and medications. Medications may include stool softeners, laxatives and suppositories.

Problems with Movement

Some people have mobility problems after a brain injury. These problems can range from difficulty with balance and coordination, to weakness or paralysis requiring the use of a wheelchair. Mobility problems may get better with therapy, practice and time.

Suggestions for mobility problems:

- If the person needs a wheelchair, allow him/her to propel it if possible. It is okay to help if the person gets tired, but encourage him/her to help as much as possible.
- Once the physiotherapist says it is safe, you can assist the person to walk.
- Learn how the person transfers to the wheelchair so that you can help if needed, or give reminders of the right steps so the transfer is done safely.

Spasticity

Spasticity can result from damage to the brain causing messages between the brain and muscles to get mixed up. As a result, the muscles may stay tight and contracted. Movement may become stiff, jerky and uncomfortable. Spasticity needs to be treated if it causes discomfort, interferes with mobility, or interferes with activities of daily living (washing, dressing, eating). There are several treatments for spasticity. The health professionals working with the person will be able to decide on the best treatment.

Possible treatments for spasticity:

- Stretching
- Splinting
- Medications by mouth
- Casting
- Botox injections

Fatigue

Fatigue (feeling tired) is another common problem after brain injury. People often need more sleep at night and a nap in the afternoon. He/she may tire more easily because everything requires thinking. Rest is important because without it the person may get agitated. Also, if tired he/she may have even more difficulty concentrating on things and remembering things.

Some suggestions for fatigue:

- Encourage rest periods. The person may not be able to tell when a rest is needed. A daily schedule with built in rest periods can help.
- Encourage an early bedtime.
- Plan activities for when his/her energy level is best, such as in the morning or after a nap.
- Once the person starts going on weekend passes, keeping the number of visitors at a minimum may be best. This will enable you all to get enough rest.

Swallowing Problems

Difficulty swallowing is called dysphagia. It can place the person at risk of food going into his/her lungs. If this were to happen, the person might end up getting aspiration pneumonia. A person may need a feeding tube if he/she cannot swallow safely. If a person with a brain injury is having trouble with swallowing, a dietitian and a speech-language pathologist will do an assessment. They may assess the quality of the swallow with testing at the bedside, or they may need to do a modified barium swallow (MBS). An MBS is done in the X-Ray Department. The patient will be asked to eat various foods that have been coated with barium. The barium allows us to see the swallow when the X-ray machine is on. If the

person has swallowing problems, the speech-language pathologist and dietitian will provide suggestions to help ensure he/she is safe and doesn't choke.

These suggestions often include:

- Recommendations about safe food consistencies
- The amount of food to be eaten at a time
- Positions to help swallowing
- Optimum conditions for mealtime

Other suggestions for safe swallowing

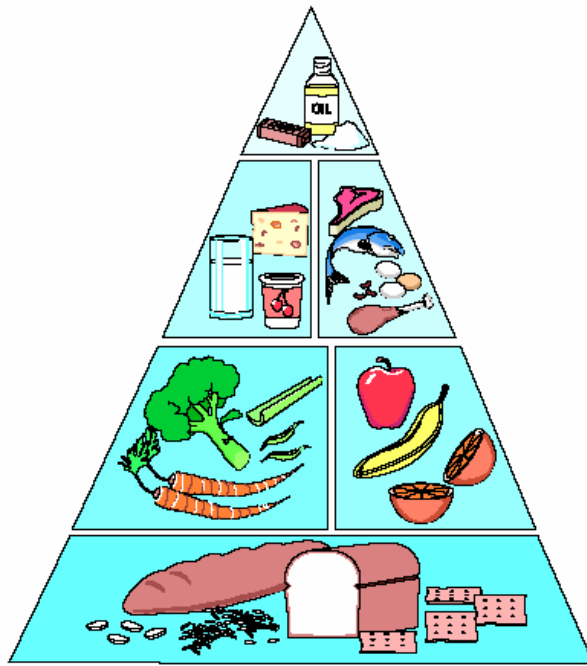
- Always follow the specific safe eating and diet guidelines provided by the dietitian and speech-language pathologist.
- Ensure that mealtime is quiet. Limit distractions to foster better concentration on eating.
- Ensure that the teeth are brushed and the mouth is rinsed out 4 times a day, or as often as the swallowing team suggests. This will decrease the number of bacteria in the mouth. This can decrease the risk of getting a lung infection if the person aspirates.
- Sit up for meals. Stay up for 30 minutes after a meal.

Nutrition

Nutritional needs are extremely high after brain injury. Extra energy, protein and nutrients are needed to help the brain recover.

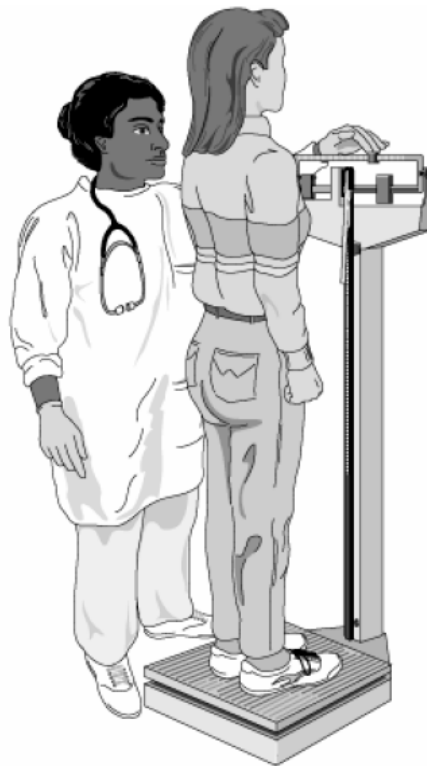
Strategies to meet nutritional needs:

- When a person is not able to eat enough, a nasogastric or gastrostomy tube may be needed to ensure nutritional needs are met.
- A texture-modified diet is often suggested to ensure the person is eating safely. As the ability to safely swallow improves, the diet will be gradually advanced to a regular consistency.
- As recovery progresses, energy needs decrease. A balanced diet is needed to ensure a desirable weight and good health.



Weight

The central part of the brain regulates appetite. If this area is damaged, the person may not be able to feel or perceive that the stomach is full. There may also be memory and/or emotional changes that affect eating habits. The person may require adjustments to his/her diet as patterns become clear. If the individual continues to eat larger portions, reports feeling frequently hungry, and is gaining weight a schedule may be needed to assist him/her to maintain a healthy weight. Things like providing small healthy snacks frequently during the day instead of 3 large meals may be needed.



Vision Problems

Problems with vision can be scary and hard to deal with. It can be an even bigger challenge after a brain injury when a person is already trying to cope with changes in thinking and behaviour. Some of the vision problems that a person may have are a drooping eyelid, double vision, blurry vision, or a loss of vision.

A drooping eyelid can make it hard to judge distances, to see where steps are, and to do things like pour liquids from one container to another. Sometimes when someone has a droopy eyelid, the eyelid doesn't close all the way. When this happens, eye drops and ointment may be used to keep the eye moist.

Double vision means that a person sees two of everything. Someone with double vision tends to bump into things. An eye patch may be used.

When a person has blurry vision after a brain injury he/she may see close-up things clearly, but the things that are farther away might be blurry. To help with this, keep things in the same place so that the person can get used to where things are.

A brain injury can also cause loss of vision. This loss of vision may be complete or partial. If this is the case, you will be given further information and support about coping with vision loss.

Changes to the Skin

After a brain injury, the oil glands in the skin can become overactive. This can cause acne on the face and even the back. Acne preparations may be applied to the face if ordered. The hair may also get oily, and should be washed as needed.

The skin needs to be checked for any scrapes or red areas that could become pressure ulcers if the person has had a loss of sensation. If he/she spends time in bed or a wheelchair, it is important to change position about every 2 hours in order to prevent pressure on the bony areas of the body.

Seizures

After a brain injury, scar tissue may form on the brain tissue as it heals. This scarring can interrupt the regular electrical activity in the brain and can cause seizures. A seizure is a sudden change in behaviour due to an excessive

electrical activity in the brain. The person with a brain injury who has a seizure disorder is often said to have post-traumatic epilepsy.

Types of Seizures

There are many types of seizures. The behaviours produced by this electrical activity may include loss of consciousness and shaking of various body parts. In other types of seizures there may not be a loss in consciousness, but there may be sudden gaps in talking, eyelid fluttering, or lip smacking.

Tonic-Clonic Seizure (Grand Mal Seizure) - the most common type of seizure

- Generally last 2-5 minutes, but may last longer.
- The person may call out, become unconscious and fall.
- A stiffening of the leg and arm muscles, followed by jerking movements.
- May bite tongue.
- May froth at the mouth.
- Breathing may stop and face may turn blue.
- Jaws clench tight.
- Hands clench tight.
- Eyes may be opened or closed.
- Bladder or bowel control may be lost.
- Snoring sounds while breathing may indicate the end of the seizure.
- Confusion and/or headache often occur after the seizure.

Complex Partial Seizure

- Generally lasts a few minutes.
- The person may smell something funny or odd.
- May experience a funny taste.
- May have a sense of something that already occurred “déjà vu”.
- May smack lips or make chewing motions.
- May pat or pick at clothes dreamily.
- May have difficulty or inability to talk.
- Will be generally unaware this seizure activity is occurring.
- Confusion and drowsiness are common after seizures.

Absence Seizure

- Lasts only a few seconds.
- Suddenly stops talking.
- A lapse in awareness of surroundings.
- Stares blankly or eyelids may flutter.

Atonic Seizures

- Loses muscle tone and falls to the ground.

Causes of Seizures

Although a person with a brain injury may already be taking medication to control seizures, certain situations may initiate a seizure. They are:

- Fever
- Sick with flu or colds
- Fatigue
- Emotional upsets or stress
- Poor nutrition
- Flashing lights
- Loud noises
- Constipation
- Menstruation
- Reduced oxygen
- Low blood sugar
- Drinking alcohol
- Drug use (especially cocaine or stimulants)
- Alcohol withdrawal

First Aid for Seizures

- Protect the person from injury. Place something soft under the head.
- Remove any dangerous items from the area.
- **Do not** try to hold or restrain the person.
- **Do not** put any object in the person's mouth or between the teeth.
- **Do not** give anything to drink or eat.
- Stay with the person and speak softly.
- Call 911 for an ambulance if seizure activity continues over 5 minutes or as recommended by your doctor.

- Keep a record of all seizures. Record the date, time and what you observed the person doing before, during and after the seizure. Time the seizure and record.

Medications (Anticonvulsants)

Anticonvulsant medications are given to the person with a brain injury to control seizure activity. Initially, changes in the dosage are made to ensure there is the right amount of medication circulating in the blood to control seizure activity. Once the dose is decided, the doctor will continue to monitor the medication levels on a regular basis to ensure the levels remain constant.

There are possible side effects with any medication. Please discuss with the doctor the side effects that are specific to the medication.

Listed below are a few of the medications commonly used to control seizures and some of the possible side effects:

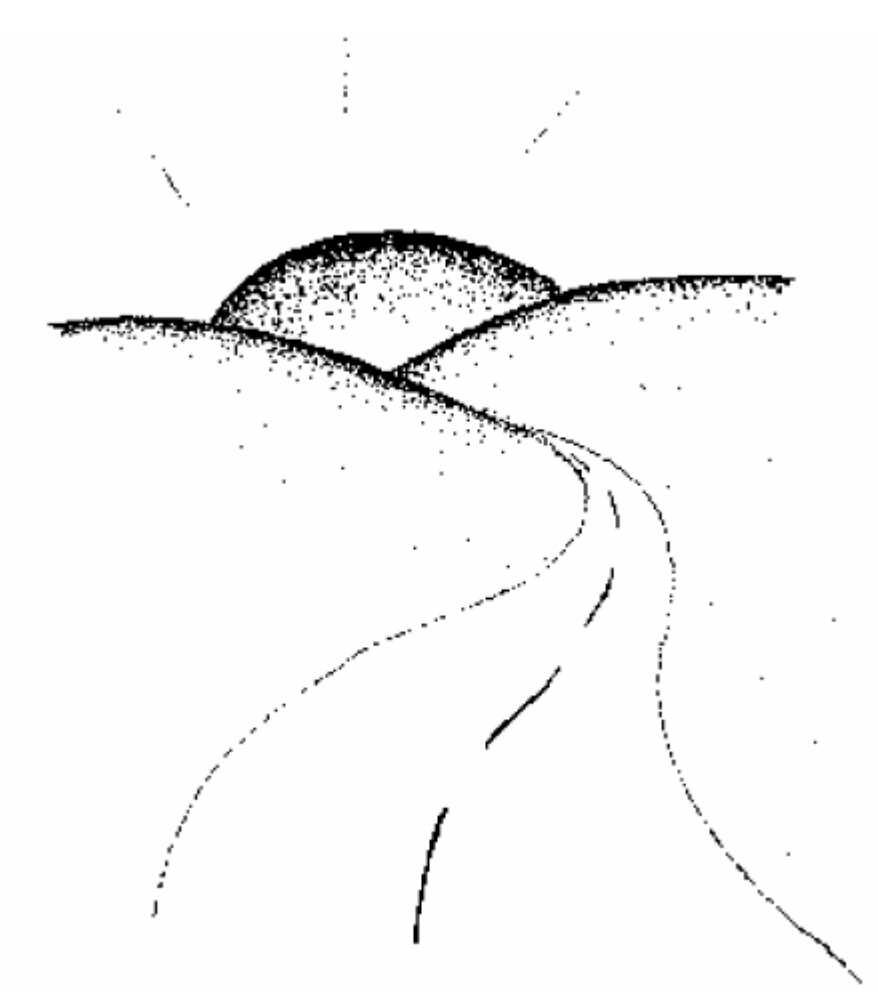
Possible Side Effects:

Dilantin/Phenytoin	Tegretol/Carbamazepine	Valproic Acid
Drowsiness Dizziness Blurred vision Unstable while walking Skin rash, like measles Dulled thinking Slurred speech Increased amount of hair on face Swollen or reddened gums	Drowsiness Dizziness Blurred or double vision Unstable while walking or moving Red skin rash (protect from sun) Headache	Drowsiness Hand tremors Weight gain Hair loss

Important information to keep in mind while on anticonvulsant medication:

- Take it at the same time every day.
- Know the name and the current dose.
- Do not suddenly stop taking the medication.
- A person with a brain injury should not drink alcohol. Alcohol may change the way the medication works and increase the risk for seizures.

Going Home



Home Recommendations

The following are some strategies and recommendations, which may help with your day-to-day functioning. Some may seem like common sense, but are strongly recommended in helping with recovery from brain injury. Share this information with family and friends - the more they understand about brain injury the better.

- Maintaining a structured daily routine is very important. This includes things like regular wake up and bed times, meal times and rest periods. Having a structured routine will help with day-to-day problem solving and planning by lessening many of the decisions which are needed when a routine is not in place.
- Ensuring an appropriate level of stimulation is thought to play an important role in supporting the natural recovery process. This involves ensuring the presence of appropriate stimulation (for example reading or playing the guitar) but avoiding or limiting situations that may be “over stimulating” (a busy mall, a large party and many visitors at once). It is important to realize that an appropriate level of stimulation depends on the person, his/her fatigue level, and the activities that he/she may have already taken part in during the day. It is especially important to keep track of a person’s reaction to situations that may be “too much” – frustration, anger, feelings of anxiety, fatigue, or unexplained restlessness may all be signs of being in an overwhelming situation. It is important to recognize these indicators so you can remove yourself from the situation.
- Attempting a balance of daily activities is also important after a brain injury. Each day should contain a balance of self care (such as personal care, doctors appointments), productivity (work or school, household responsibilities) and leisure (activities you enjoy doing). Attempt to engage in an activity for short periods of time: 30 – 45 minutes might be best. Take breaks often at first. Stop before you are exhausted.
- Ensuring adequate rest is also important. Fatigue is a very common problem after brain injury. Extra sleep at night and naps or rest breaks during the day may be needed. Try to build these breaks in the daily schedule to make sure that they happen. If you do sleep during the day, it is important that your nighttime sleep pattern not be disrupted as a result. Even if you do not sleep, lying or sitting down in a quiet spot with your eyes closed will be helpful. Any problems you may be having (for example, irritability, trouble concentrating, and memory problems) will increase if you are tired. It is very important for you to be able to recognize the early signs of fatigue so that you can remove yourself from the situation and rest. They

can include: irritability, headache, anxiety, frustration, confusion, or restlessness.

- You may be given guidelines for whether you should be left alone after you are discharged from the hospital. 24-hour supervision is often needed for several weeks after discharge. This should continue until your doctor or occupational therapist addresses it. When you can be left alone for short periods of time, plan what you will do while you are alone and avoid higher risk activities such as cooking. Emergency numbers should be posted by the phone. Review with a family member what you would do in a crisis situation (fire, fall, injury) before you are left alone.
- **Do not** take part in activities that place you at a higher risk for hitting your head such as climbing off the ground (ladder, fence and tree), riding a bicycle, skateboarding, skating, playing contact sports.
- Driving any motorized vehicles (snowmobile, ATV, motorcycle, car) must be avoided until you are given clearance from a doctor. You may need a formal driving assessment in the Occupational Therapy Department before you are given the okay to drive again. The ability to drive safely can be affected by many different things including memory, judgment, problem solving and vision.
- **Do not** use alcohol or drugs. These negatively affect the way our brain works and heals. Their use also increases your risk of having a seizure and increases your chances of re-injuring your brain. You may be on medications that interact with alcohol.
- Ask your doctor about returning to playing any sports that you used to take part in before your brain injury. While exercise is important for good health, you may need to avoid contact sports or sports that might result in a fall.



Remember that recovery from brain injury is a gradual process. Keep in mind that your ability to complete everyday activities is also affected by stress, fatigue and pain. Attempting to manage these other areas can have a positive impact on how you are functioning.

Family Changes

A brain injury is a life-altering event not just for the individual who received the brain injury, but also for those who live with the brain injury survivor. The role of the person before the injury will need to be reviewed. Does the person have the same skills and functions in the household? Will that person be able to go back to work or be retrained? If not, who will have these functions and responsibilities?

Many family members will go through a process similar to that of grieving a death in the family. The changes in the person with the brain injury may be dramatic. There may be marked personality changes. These changes are not always negative; there are times when the changes are actually for the better. Nevertheless, it is possible that you will feel like you are with a stranger. Others who don't understand all of the changes that have happened to your family member can unintentionally make these feelings worse. Often people think that because a brain injury survivor looks the same, then he/she must be the same.

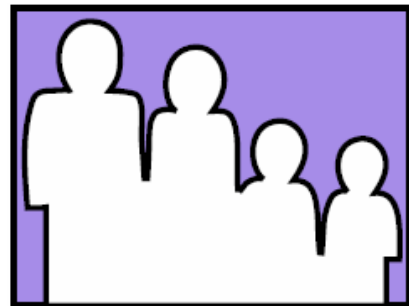
Some of the emotions you may have are grief, anger, guilt, blame and denial. It is natural to feel these emotions. Recognize that these feelings are normal. It may help to talk to others about how you are feeling.

Stress is another common reaction family members have after brain injury. You have many things to think about and plans to make. Stress can feel worse when you are tired. Realize how important your sleep is and try to get enough. Remember to take time to care for yourself.

Let other family members and friends give you support. Keep in touch with your friends. If they want to help, try and let them. This can be difficult to do. Many people feel the need to "keep up a good front", to do everything themselves, and to be present at the hospital as much as possible. This is understandable, but it is very hard to keep this up. So when someone asks if he/she can help, try to think of something that can be done that will help you.

Remember that we are here to help you.

If you need to talk, we are here to listen.



Leisure Activity

Leisure activities are excellent ways of releasing stress, gaining skills, increasing enjoyment of life, and experiencing satisfaction. A brain injury may result in some lifestyle changes.

Some of these changes can occur in a person's leisure and recreational pursuits.

Challenges to Leisure	Strategies
The brain injury survivor may have a dramatic increase in free time, especially if it is not possible for the individual to return to work or become involved in past leisure activities.	<ul style="list-style-type: none"> • Establish a daily routine. • Include scheduled and unscheduled recreation opportunities. • Encourage the person to choose between two activities. This supports exercising choices for what they want to do with their time. • Create support and structure around leisure choices.
Encourage the person to take part in hospital and out-of-hospital recreational activities (families and friends are welcome to attend).	<ul style="list-style-type: none"> • Help with planning for leisure by using a check off system to make sure plans are successful. • Be patient and understanding. A person who suddenly loses the ability to do familiar activities may find it hard to start them up again, or to try new ones.
The brain injury survivor may have a decrease in social skills and opportunities for leisure activities because of physical problems or poor communication skills.	<ul style="list-style-type: none"> • Maintain friendships by using planned leisure experiences. • Think about the people who give you support. Relationships with family and friends, although they may be different than before, may prove to be very helpful in providing support if needed. • Try structuring social activities in short time periods with one or two other people. Large groups can be overwhelming.
Social situations may be difficult.	<ul style="list-style-type: none"> • Provide coaching before social events. Practice responses to common questions or situations.
Excessive talking.	<ul style="list-style-type: none"> • Gently let the person know that he/she has already said that. • Let the person know that you have something that you want to say. • Try changing the topic.

<p>Sometimes individuals may have a lack of interest, motivation, or ability to generate ideas for leisure activities.</p>	<ul style="list-style-type: none"> ● If depression is suspected, talk to the doctor. ● For low mood, try diverting the person's attention to a more pleasurable activity. ● Incorporate exercise as part of the daily routine. ● Create an "I'd like to" list. Keep it close by to help spark activity ideas. ● Avoid long periods of inactivity. You may need to provide the "get up and go". ● Work with the person to help plan activities for weekends and passes. ● Provide puzzles, books, radio, and pictures, both in the hospital and at home. ● Model the importance of leisure and recreation by taking part in activities yourself.
<p>Lack of adequate resources (for examples facilities, programs, adapted equipment) in the person's community.</p>	<ul style="list-style-type: none"> ● Creativity is often needed in resolving this challenge. ● Community Parks and Recreation organizations may be a helpful resource. ● Talk to others who may have had similar experiences by contacting Brain Injury Association resources. ● Contact your local member of government to talk about your needs.

Planning for Leisure

Three places I can go for recreation/leisure/fun are:

- 1) _____.
- 2) _____.
- 3) _____.

Three places I can get information on recreation/leisure/fun are:

- 1) _____.
- 2) _____.
- 3) _____.

Three things I like to do with my family/friends are:

- 1) _____.
- 2) _____.
- 3) _____.

Three really cheap things I can do for fun are:

- 1) _____.
- 2) _____.
- 3) _____.

Three things I can do at home for recreation/leisure/fun are:

- 1) _____.
- 2) _____.
- 3) _____.

Describe your favourite leisure pursuit. What makes it your favourite?

- 1) _____.
- 2) _____.
- 3) _____.

If you could learn a new leisure pursuit what would it be?

- 1) _____.
- 2) _____.
- 3) _____.

Recommended Readings

- **Living with Brain Injury: A Guide for Families and Caregivers.** (1998). Sonia Acorn & Penny Offer. University of Toronto Press.
- **Over my head: A Doctor's Own Story of Head Injury from the Inside Looking Out.** (2000). Claudia L. Osborn. Andrews McMeel Publishing.
- **I'll Carry the Fork: recovering a life after brain injury.** (2003). Kara L. Swanson. Rising Starr Press.
- **Head Injury: The Facts.** (1998). Dorothy Gronwall & Philip Wrightson. Oxford University Press.
- **Head Injury: Information and Answers to Commonly Asked Questions (A Family's Guide to Coping).** (1998). Christopher D. Strum, Thomas R. Forget, & Janet L. Strum. Quality Medical Publishing Inc.

Brain Injury Web Sites

www3.ns.sympatico.ca/bians1	Brain Injury Association of Nova Scotia
www.obia.on.ca	Ontario Brain Injury Association
www.head-injury.org.nz	New Zealand Head Injury Society
www.headway.org.uk	Headway National Head Injuries Association U.K.
www.biausa.org	Brain Injury Association USA
http://www.neuroskills.com/	Traumatic Brain Injury Resource Guide
www.tbiguide.com/	Traumatic Brain Injury Survival Guide by Dr. Glen Johnson
www.tbi.pmr.vcu.edu/	Virginia Commonwealth University Traumatic Brain Injury Model System

Some Medical Words

Activities of Daily Living (ADL) - Bathing, dressing, feeding, toileting and grooming.

Agnosia - Loss of the ability to know the meaning or significance of things. It can affect the interpretation of what we see or hear, the parts of the body, or taste and smell.

Anticonvulsants - Medication to control epilepsy (seizure activity).

Aphasia - Total loss of the ability to make oneself understood (expressive) or to understand others (receptive), by the use of language. It can affect the use of speech, writing, listening, or reading, and sign language.

Anoxia - Lack of oxygen, in this context for the brain cells.

CAT Scan (CT Scan) - Computerized axial tomography, an X-ray procedure that gives a picture of soft tissue, especially of the brain, as well as of bone.

Coma - A state of altered consciousness, when the person is not reacting normally to stimuli.

Concussion - A mild head injury, with a temporary disturbance of brain function, usually but not always with a short loss of consciousness. Its effects may persist.

Contusion - Bruising, in this context usually of the brain.

Dysphagia Team - Swallowing Team made up of a dietitian and a speech-language pathologist.

EEG (electroencephalography) - Changes in the electrical potentials in various areas of the brain are recorded by means of electrodes placed on the scalp.

Instrumental Activities of Daily Living (IADL) - Home management and money management.

Mild Head Injury - A head injury from which the majority of people recover completely, though a small percentage have persisting problems.

MRI (Magnetic Resonance Imaging) - A procedure that like the CT scan gives a picture of the soft tissue of the brain, but which uses a strong magnetic field and radio waves rather than X-rays.

Post-traumatic Epilepsy - Epileptic seizures occurring due to brain damage in the head injury; may be several types.

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- Gronwall, D., Wrightson, P., & Waddal, P. (1998).** Head injury: the facts, (2nd ed.). New York: Oxford University Press.
- Maisey, D. (2001).** The never ending journey: Discharge planning guide. Available from Dayla Maisey at P.O. Box 569, Okotoks, AB, T1S 1A7.
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