EDUCATING EDUCATORS ABOUT ABI

Teaching classroom teachers how to accommodate students living with the effects of acquired brain injury
Educating Educators About ABI Resource Binder

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and
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Educating Educators

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Resource Binder

Preface

It is estimated that there are approximately 27,000 students who have a brain injury in the classrooms of Ontario. This manual is intended as a resource to anyone involved in the education of a student who is living with the effects of an acquired brain injury. It grew out of my own frustration at the lack of resources and knowledge in the field. This became apparent when I was challenged to teach these very special students. One of my goals when I started my new career at the Ontario Brain Injury Association was to provide teachers with a resource that would help them to help students living and learning with the effects of an acquired brain injury.

In this endeavour, I’ve had the good fortune to work with Dr. Dawn Good, Director of the Centre for Neuroscience, Past Chair of the Psychology Department and Research Member of the Centre for Lifespan Development Research at Brock University, Dr. Sheila Bennett, Professor, Faculty of Education at Brock University, Dr. Dawn Zinga, Associate Professor, Child and Youth Studies and a number of extraordinary research assistants. This group spent 3 years researching and developing the materials that are provided here. Since the manual was first released, copies have been distributed in Ontario, across Canada and to Educators as far away as England and Australia. It has also been translated into Japanese and distributed in Japan. The team has made dozens of presentations to Educators, Psychologists, Speech and Language Pathologists and Child and Youth Workers. Another grant from the Ontario Neurotrauma Foundation allowed the authors to create videos illustrating a few of the strategies that work with students who have a brain injury.

Educators are invited to use this manual, copy it and share it—free of charge. In addition, more information on Acquired Brain Injury can be found on the OBIA website: www.obia.ca

Our deepest appreciation goes out to the many educators who participated in this study and to the Ontario Neurotrauma Foundation, which funded the project.

Sincerely,

John Kumpf
Former Executive Director (1998-2010), OBIA
Primary Investigator, ONF Project

We also invite you to contact us at OBIA, tel: 1-800-263-5404, or by email: obia@obia.on.ca, for further information.
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Chapter 1

Brain and Function in the Context of Acquired Brain Injury

1.1 Case Study
1.2 The Brain is Who You Are
1.3 Brain Physiology and Behaviour
1.4 What is Acquired Brain Injury?
1.5 What Happens When the Brain is Damaged?
1.6 Who Does Acquired Brain Injury Affect?
1.7 Brain and Function
1.1 - Case Study

Adam was 5 years old when he fell down the basement stairs while hurrying to catch up with his 7-year-old brother. He was dazed and lay motionless for a few minutes at the bottom of the stairs, until Mom came to help. After a few tears, Adam seemed OK and eagerly followed Mom into the kitchen for a cookie. Later that day he began to vomit and his mother was concerned enough to take him to the hospital where he was initially diagnosed with concussion.

Over the next few weeks and months, Adam’s “personality” seemed to change. He was more obstinate and easier to anger; he was slower than usual, even lazy, when asked to do simple things like get ready for school. His kindergarten teacher noticed a change in his social behaviour with others. By the end of the year, the school’s recommendation was for Adam to retry kindergarten. His parents, at the suggestion of the school team, took Adam for a full physical exam which, after a referral to a neurologist, resulted in a CT scan. Adam was finally diagnosed with a mild brain injury.

1.2 - The Brain is Who You Are

Since the brain is responsible for the most complex of human functions such as thinking, problem solving, emotions, consciousness and social behaviour, it essentially controls and defines your personality or who you are. It also controls basic bodily functions such as breathing, eating, sleeping, moving and the five senses, as well as being responsible for how we think, feel, perceive and act in the world - it is the organization of who we are.

If an external force is strong enough to either fracture the cranial bones, or an internal rotational force occurs due to impact causing the brain to hit or scrape against the inside of the skull, the brain will tear and/or neurons will be damaged - and we will change.
1.3 - Brain Physiology and Behaviour

The brain is made up of cells called neurons and with the spinal cord makes up the central nervous system (CNS).

At birth, we have essentially all the neurons we will ever have for the rest of our lives. Although most neural differentiation is accomplished by 6 months postnatally, development continues until we are 25 years old in terms of growth in size, dendritic connections, the process of parsing (natural progression of neurons dying) and myelination (formation of myelin on axons).
The brain is quite fragile and has a soft jelly-like consistency. In order to protect this fragile organ, the body has developed three lines of defense:

1st Line of Defense - Hair and Skull
- Hair prevents excessive heat loss
- The skull provides a bony case that encapsulates and protects the brain from external impact (note: the inner surface of the skull is not entirely smooth, but contains rougher areas and ridges along its ventral portion)

2nd Line of Defense - The Meninges
- Three thin membranes found between the skull and the brain which serve to protect the integrity of the brain’s physical structure and provide shock absorption
- Also known as the blood-brain barrier, the meninges surround the brain and spinal cord and form a barrier which selectively controls the transportation of all substances into and out of the brain.

3rd Line of Defense - Cerebrospinal Fluid
- Fluid found within the ventricles of the brain and in between the meninges which can serve as a cushion or shock-absorber and provide a fluid vehicle for transportation of material.
The most basic functional unit of the nervous system is the nerve cell or neuron. Neurons carry information to and from the brain, integrate and interconnect the various regions of the brain and body and store information. We are born with approximately 100 billion CNS (Central Nervous System) nerve cells and 10 trillion PNS (Peripheral Nervous System) nerve cells.

Unlike the other cells in our body, those of the nervous system cannot divide - in other words, at birth we have essentially all the neurons we will have for the rest of our lives.

Fortunately each neuron can make anywhere between one and 10,000 connections with other neurons, resulting in a massive number of inter-connected networks throughout the brain - sufficient for a lifetime. These connections are extremely fragile and even minor damage to any of these networks can cause disruptions and impairments in function and behaviour.
The brain is comprised of four main parts:

A. The brainstem
B. The cerebellum
C. The subcortical structures
D. The cerebrum

A. The Brainstem - connects the base of the brain to the spinal cord at the level of the neck and upwards through the bottom (central) surface of the brain. It controls basic life functions such as breathing, heart rate, blood pressure, arousal (sleep/wakefulness) and aids in maintaining alertness. In addition, the brain stem acts as the relay station for motoric and sensorial input and output between the brain and the peripheral nervous system. Damage can result in coma, dysarthria (speech difficulties), choking, fatigue (cognitive and physical) and disorientation. (For more information see Section 1.7A)
B. The Cerebellum - is primarily involved in controlling balance and equilibrium, and coordination of fine and gross body movements. Damage to the cerebellum can result in tremors, loss of motor control, slurred speech, impairments in balance (i.e., dizziness, vertigo, difficulty in standing or walking) and difficulties in precise motor fluency (e.g., timing of an action adjustment of force). (For more information, see Section 1.7B)

C. Subcortical Structures:

   Basal Ganglia - These structures control gross motor function such as posture and balance as well as the initiation of and management of voluntary movement, e.g., walking, clutching, reaching. (For more information, see Section 1.7C)

   Limbic System - This system consists of several different structures (hippocampus, mamillary bodies, amygdala, septum, fornix, etc.) which together permit the expression of emotions, the establishment of memories and the coordination of these as a function of cortical awareness. (For more information, see Section 1.7D)

   Thalamus - This is the central relay station for incoming sensory information which directs information towards the cortex for awareness and perception and towards other parts of the brain which are reliant on information from our external environment. (For more information, see Section 1.7E)
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Hypothalamus - This structure is at the very base of the brain and controls the body through its direction of the pituitary gland and the autonomic nervous system. In doing so, it regulates and directs behaviours that are fundamental and necessary for our survival, namely: feeding, drinking, sleeping, reproduction, temperature control and emotion (negative and positive). (For more information, see Section 1.7E)

D. The Cerebrum - is divided into right and left halves, referred to as “hemispheres”. The cerebral hemispheres are the most highly evolved and most complex part of the entire brain. Their outer layer, the cortex, is folded into numerous convolutions, called gyri to provide more surface area within the limited space allowed by the skull. These gyri are so tightly packed that only about 30% of the cortex is actually visible from the outside surface. The cortex integrates information from lower systems and adjacent areas, allowing us to perceive, interpret and react meaningfully to our environment.
The Cerebrum - Thought and Control of Behaviour

The cortex has two main functions:
1) Produce thoughts that monitor and analyze incoming information to the brain;
2) Control behaviours such as action, interpretation, initiation, planning, organization, and self-awareness.

The cortex allows us to perceive the outside world:
- Our thoughts are organized;
- Our experiences are individualized and stored in memory;
- Speech is understood and produced;
- Scenery is seen;
- Music is heard.

Each hemisphere is responsible for the opposite side of the body. The right hemisphere controls movement and receives information from the left side of the body and the left hemisphere does the same for the right side of the body.

In nearly all right-handed individuals and most left-handed individuals:
- The left cerebral hemisphere is specialized for language skills such as speaking, listening, reading and writing;
- The right hemisphere is specialized for spatial abilities such as knowing directions, solving puzzles, drawing pictures and recognizing familiar objects or people.

Across individuals there is a wide range in the level and partitioning of dominance between the left and right hemispheres. Rather than being strictly hardwired, the brain’s plasticity allows for occasional compensation for a certain loss of function when the other hemisphere has been damaged. However, many factors impact this effect. (For more information, see Section 1.7F)
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The cerebral cortex is divided into 4 distinct lobes separated by grooves called sulci. The 3 major lobes located towards the back of the brain are known as the temporal, occipital and parietal lobes. Each is specialized for receiving, perceiving and interpreting a particular kind of sensory information: namely, hearing, vision and touch, respectively. Since these lobes take in information (e.g. sensations) from the outside world, they are known as the input lobes.

The frontal lobe located towards the “front” of the brain is different from the other lobes because its primary role is integration and response to the environment, at output. The frontal lobe receives and integrates the information (e.g., sensations) from the other lobes and then determines the best way to interact with the environment based on the sensory information.

---

**Lobe Function: Input vs. Output**

Damage to any one of the input lobes will result in misperceptions, miscommunication and misunderstanding of information within the brain.

---

![Brain Diagram](Image)
Damage to Specific Regions of the Brain

Different regions of the brain specialize in different functions. Therefore, damage can lead to different types of deficits and difficulties, depending on the area of the brain that has been affected. A focal (localized) injury will usually result in very well-defined deficits. A diffuse (covering a wide area of the brain) injury may result in a broad spectrum of deficits that may vary in severity.

**Frontal Lobes:**
- Disruptions in complex motor skills, including speech;
- Difficulties planning, organizing and sequencing events;
- Loss of control over emotions and behaviour (i.e., personality changes), decreased self-awareness, poor judgement and reduced social skills;
- Decreased attention and loss of memory.

**Parietal Lobes:**
- Reading, writing, and language disorders;
- Difficulty recognizing visual and tactile information;
- Difficulty with dressing, drawing and hand-eye coordination;
- Distortions in body image and spatial abilities (i.e., inattention to information received on one side of the visual field).

**Temporal Lobes:**
- Specific memory impairments (i.e., prosopagnosia - inability to recognize faces);
- Difficulty understanding spoken language (i.e., aphasia);
- Impaired sense of smell.

**Occipital Lobes:**
- Impairments in visual awareness and recognition (For more information, see Section 1.7 G-J)
1.4 - What is Acquired Brain Injury?

ABI, or acquired brain injury, is any type of sudden injury that causes temporary or permanent damage to the brain. Damage that is associated with some kind of trauma to the head such as a concussion, a fall, or a motor vehicle collision is known as a traumatic brain injury. Injuries can also occur as a result of other factors, such as: anoxia (e.g., near drowning), toxicity, infection or cerebral vascular accident (CVA, e.g., stroke).

1.5 - What Happens When the Brain is Damaged?

The brain is made up of cells called neurons, which are unique to the central nervous system. At birth, we have essentially all the neurons we will ever have for the rest of our lives.

Once the nucleus (or cell body) of the neuron has been damaged, the neuron is unable to successfully reconnect or heal itself. Therefore, once a neuron is injured and dies, the damage to the brain as a whole is permanent.
The brain is an interconnected network of neurons that communicate with each other. Through communicating with each other, neurons rely on one another to pass along vital information. If a group of neurons becomes damaged and dies, then the neurons with which they once communicated will no longer receive information. Once those neurons are no longer receiving information from the damaged neurons, they will become inactive and die as well. This is how one centre of injury can result in damage in distal (distant) and other areas.

When assigning a diagnosis, medical professionals will define the severity of a brain injury by using the terms mild, moderate or severe. The size of the injury does not always predict the level of dysfunction. Other factors, such as age at injury, cause of injury and most of all site of injury, determine functional outcome and (dis)ability.

Despite these definitions it is important to realize that any brain injury has the potential to affect the way a person lives, learns and interacts with others.

**Mild ≠ Trivial**

(i.e. mild injury is not equal to trivial injury)
1.6 - Who Does Acquired Brain Injury Affect?

- There are approximately 27,000 school-aged individuals in Ontario who have sustained a brain injury.
- Brain injuries do not only affect an individual, they affect the families, friends and communities.

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ABI is no respecter of a person's age or socio-economic levels. It can and does strike young and old, rich and poor alike. Statistics show that male adolescents and adults under the age of 25 are the population at greatest risk. The greatest increase in ABI occurrences, not surprisingly, is in the fastest growing demographic group, namely seniors who are at increased risks for falls.

It is important to know that when an ABI occurs, the effects ripple out from the injured person to impact on family, friends, classmates, co-workers and the community in general. Schools become a major player in reintegrating and accommodating students who experience ABI; but the school should seek to ally itself with the family and other significant parts of the community. In this way the school can benefit from strategies proven in other venues and be a part of a co-ordinated program to achieve optimum functioning for the student.

The remainder of this resource binder will focus on the impact of ABI on students, both inside and outside of the classroom and how educators and others in the educational system can help to meet the needs of these students so that they can experience success.

As educators, it’s important to become more informed about ABI so that you can help provide a safe and structured learning environment. Many simple procedures included in this guide can be put in place and will dramatically improve both the functioning of the classroom and the student’s future.
1.7 - Brain and Function

Tables’ A-J provide information on areas of the brain and the result of injury to those specific regions.

**Table (A) Brainstem**

<table>
<thead>
<tr>
<th>Where is it?</th>
<th>What does it do?</th>
<th>What happens when it is injured?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brainstem is located at the base of the brain and extends down to become the spinal cord. Three main parts make up the brainstem, including the medulla, the pons and the midbrain.</td>
<td>The medulla controls basic involuntary life functions such as respiration, blood pressure, heart rate and body temperature control. In the pons and extending up through the midbrain is a structure called the reticular activating system. This system affects sleep onset and a person's level of alertness.</td>
<td>- A disturbance in breathing, heart rate or other vital bodily functions. - Decreased levels of alertness and arousal. - Dysphagia - difficulty swallowing food and water. - Sleeping difficulties (e.g., insomnia, sleep apnea). - Disturbance in sleep/wake cycles.</td>
</tr>
</tbody>
</table>
The cerebellum is located underneath the lower back part of the cerebral hemispheres.

- Controls balance, timing and equilibrium.
- Coordination of both fine and gross body movement such as walking, sitting down and manipulating objects with the hands.

- Ataxia - failure in muscle coordination (e.g., a limb may appear to shake, making it difficult to use the limb).
- Balance problems, making it difficult to stand or walk independently.
- Difficulty reaching out and grabbing objects.
- Persistent dizziness or vertigo.
- Slurred speech.

### Table (B) Cerebellum

<table>
<thead>
<tr>
<th>Where is it?</th>
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</tr>
</thead>
<tbody>
<tr>
<td>The cerebellum is located underneath the lower back part of the cerebral hemispheres.</td>
<td>- Controls balance, timing and equilibrium.</td>
<td>- Ataxia - failure in muscle coordination (e.g., a limb may appear to shake, making it difficult to use the limb).</td>
</tr>
<tr>
<td></td>
<td>- Coordination of both fine and gross body movement such as walking, sitting down and manipulating objects with the hands.</td>
<td>- Balance problems, making it difficult to stand or walk independently.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Difficulty reaching out and grabbing objects.</td>
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<tr>
<td></td>
<td></td>
<td>- Persistent dizziness or vertigo.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Slurred speech.</td>
</tr>
</tbody>
</table>
The basal ganglia are a small collection of neurons located deep inside the cerebral hemispheres on either side of the thalamus.

<table>
<thead>
<tr>
<th>Where is it?</th>
<th>What does it do?</th>
<th>What happens when it is injured?</th>
</tr>
</thead>
<tbody>
<tr>
<td>The basal ganglia are a small collection of neurons located deep inside the cerebral hemispheres on either side of the thalamus.</td>
<td>- Control of involuntary movement such as that seen in resting-type postural movement and body position when there is no voluntary movement. - Initiating voluntary movement such as walking or talking.</td>
<td>- Movement disorders such as an inability to initiate voluntary movements (e.g., person needs to be cued to take a step before beginning to walk). - Lack of postural control or control over body position (e.g., person will slouch to one side when sitting at rest).</td>
</tr>
</tbody>
</table>
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Table (D) Limbic System

<table>
<thead>
<tr>
<th>Where is it?</th>
<th>What does it do?</th>
<th>What happens when it is injured?</th>
</tr>
</thead>
</table>
| The limbic system is a ring-like collection of structures deep within the cerebral hemispheres adjacent to the basal ganglia. | - Areas of the limbic system like the hippocampus are responsible for storing and recalling explicit memories.  
- Others, like the amygdala are involved in the production of feelings or emotions. | Numerous problems of internal body regulation and higher behaviours can result, such as:  
- Memory and learning difficulties.  
- Inability to explicitly recall information.  
- Extreme inappropriate emotional states. |
### Table (E) Thalamus

<table>
<thead>
<tr>
<th>Where is it?</th>
<th>What does it do?</th>
<th>What happens when it is injured?</th>
</tr>
</thead>
<tbody>
<tr>
<td>The thalamus sits at the top of either side of the brain stem in the centre of the brain.</td>
<td>- Central relay station for incoming sensory information. The thalamus decides where the information must go within the cortex and sends it there to be perceived and analyzed.</td>
<td>This is dependent on which sensory receiving area is damaged (e.g., if it is the visual receiving area, information will not be properly sent to visual areas in the cortex and visual deficits will result).</td>
</tr>
<tr>
<td><img src="image1.png" alt="Thalamus Image" /></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| The Hypothalamus is directly below (hypo) the thalamus at the base of the brain. | - The hypothalamus controls the behaviours that require us to interact with our environment in order to survive such as the regulation of feeding, drinking, sexual behaviour, sleeping, temperature control and emotional expression. | Hypothalamus damage can result in deficits such as:  
- How to recognize when the stomach is full or empty.  
- How to recognize when the body needs fluids.  
- How to recognize when the body needs rest.  
- Regulation of sexual urges/signals.  
- Emotional Lability - e.g., bouts of uncontrollable crying or laughing.                                                                                                                                                        |
| ![Hypothalamus Image](image2.png)                                         |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                          |
Table (F) Left and Right Hemispheres of the Brain

<table>
<thead>
<tr>
<th>Left Hemisphere</th>
<th>Right Hemisphere</th>
</tr>
</thead>
</table>
| Processing & Analysis of Information | - Logical  
- Sequential  
- Analytical  
- Concentrates on details  
- Deductive reasoning | - Holistic  
- Global  
- Parallel processing  
- Comprehension  
- Inductive reasoning |
| Specialized Skill | - Verbal  
- Lexical aspects of relative spatial abilities  
- Relationships between self and environment  
- Analytical space-time concepts (e.g. numerical operations)  
- Language (speaking, listening, reading, writing) | - Spatial abilities (knowing directions), especially in 3 dimensions without reference  
- Solving puzzles  
- Drawing pictures  
- Recognizing objects and people  
- Nonverbal language (timing, intention, pragmatics)  
- Space-time complex concepts (e.g., physics) |
| Sensory Perception & Motor Function | - Responsible for the right side of the body's skeletal muscles and somatosensation  
- Interprets the left visual field  
- Bilateral audition | - Responsible for the left side of the body's skeletal muscles and somatosensation.  
- Interprets the right visual field  
- Bilateral Audition |
## Table (G) Frontal Lobe

<table>
<thead>
<tr>
<th>Where is it?</th>
<th>What does it do?</th>
<th>What happens when it is injured?</th>
</tr>
</thead>
<tbody>
<tr>
<td>The frontal lobe is located at the front of the brain just behind the forehead.</td>
<td>- Provides executive control over much of the brain's higher functions</td>
<td>- Inability to synthesize signals from the environment</td>
</tr>
<tr>
<td></td>
<td>- Consciousness</td>
<td>- Inability to assign priorities</td>
</tr>
<tr>
<td></td>
<td>- Self-awareness</td>
<td>- Inability to make decisions</td>
</tr>
<tr>
<td></td>
<td>- Judgement</td>
<td>- Inability to initiate actions</td>
</tr>
<tr>
<td></td>
<td>- Initiation/Motivation</td>
<td>- Inability to control emotions</td>
</tr>
<tr>
<td></td>
<td>- Control over emotional responses</td>
<td>- Inability to behave and interact socially and make plans</td>
</tr>
<tr>
<td></td>
<td>- Planning/Sequencing</td>
<td>- Changes in personality</td>
</tr>
<tr>
<td></td>
<td>- Word formation</td>
<td>- Inflexible, simplistic, and/or concrete thinking</td>
</tr>
<tr>
<td></td>
<td>- Prospective memory - remembering to do something</td>
<td>- Poor judgement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Inability to plan a sequence of complex movements needed to complete multi-stepped tasks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Inability to behave appropriately in social situations</td>
</tr>
<tr>
<td>Where is it?</td>
<td>What does it do?</td>
<td>What happens when it is injured?</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| The parietal lobe is located on both sides of the head near the top and to the back. | - Responsible for perceiving, analyzing and assembling touch information from the body.  
- Integrates visual, auditory and touch information in order to formulate complete impression of the world.  
Left parietal lobe  
- Area where letters come together to form words and where words are put together in thoughts.  
Right parietal lobe  
- Responsible for understanding the spatial aspects of the world including recognizing shapes, being aware of one’s body in space and deficits. | - Difficulties with hand and eye coordination.  
Left parietal lobe  
- Inability to recognize or locate touch sensations from the right side of the body.  
- Inability to know the meaning of words.  
- Anomia - inability to name objects.  
- Dyscalculia - inability to do mathematic calculations.  
- Agraphia - Inability to locate the words for writing.  
Right parietal lobe  
- Inability to recognize or locate touch sensations from the left side of the body.  
- Perceptual Agnosia - "'not knowing'" (e.g., not able to recognize familiar objects touched by the hands).  
- Difficulty with drawing objects.  
- Lack of awareness of certain body parts and/or surrounding space. |
### Table (I) Temporal Lobes

<table>
<thead>
<tr>
<th>Where is it?</th>
<th>What does it do?</th>
<th>What happens when it is injured?</th>
</tr>
</thead>
<tbody>
<tr>
<td>The temporal lobe is a large thumb-shaped extension of the cerebral hemispheres located near the temples on either side of the head.</td>
<td>A small section at the top of each temporal lobe, known as the auditory cortex, is responsible for hearing. The temporal lobes are also involved in memory acquisition, perception, and categorization of objects. - Involved in processing auditory information (e.g., sound discrimination, comprehension of language, listening, reading; music). - Important for memory acquisition, storage. - Important for sense of smell. - Involved in complex visual analysis.</td>
<td>- Disturbances with selective attention to what is seen and heard. - Memory problems. - Categorization problems. Left temporal lobe - Wernicke's Aphasia - An inability to read and comprehend what someone is saying (e.g., can form word associations but they are not language based). - Persistent talking. Right temporal lobe - Inability to recognize and appreciate music. - Prosopagnosia - difficulty in recognizing faces. - Difficulty understanding spoken language (i.e., some types of aphasia). - Specific memory impairments (e.g., Prosopagnosia/inability to recognize faces). - Impaired detection of smell.</td>
</tr>
<tr>
<td>Left temporal lobe - Specialized for the comprehension of language such as listening and reading.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right temporal lobe - Specialized for the comprehension of music.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The occipital lobe is located in the extreme rear of the cerebral hemisphere at the back of the brain. This lobe is dedicated entirely to vision in terms of detection, identification and interpretation of objects.

- Visual agnosia - not consciously knowing that one has seen an object.
- Difficulty locating objects in the environment.
- Colour Agnosia - difficulty with identifying colours.
- Word Blindness - difficulty in recognizing words.
- Inability to track the movement of objects.

<table>
<thead>
<tr>
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| The occipital lobe is located in the extreme rear of the cerebral hemisphere at the back of the brain. | This lobe is dedicated entirely to vision in terms of detection, identification and interpretation of objects. | - Visual agnosia - not consciously knowing that one has seen an object.  
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- Inability to track the movement of objects. |
Chapter 2

Understanding ABI from a Developmental Perspective

2.1 Myths About the Injured Brain
2.2 Causes of Acquired Brain Injury
2.3 Traumatic Brain Injury
2.4 Mild, Moderate and Severe Injuries
2.5 Damage at Specific Stages During Child Development
2.6 Recovery and Long-Term Consequences
### 2.1 - Myths About the Injured Brain

<table>
<thead>
<tr>
<th>Myth: All brain injuries are the same.</th>
</tr>
</thead>
<tbody>
<tr>
<td>No two brain injuries are alike. The brain is a unique and very complex organ and a brain injury is not like any other disease or injury. Recovery from a brain injury depends not only on the severity of the injury but also on the part of the brain involved. In addition, a decreased supply of oxygen, blood clots, tearing and shearing forces on the neurons, as well as swelling and bruising in the brain all play a part in determining the extent of an injury.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Myth: A brain injury will heal with time and a good physical recovery indicates that the brain has completely healed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Once the nucleus (cell body) of a neuron is damaged, the neuron dies and a new one will not take its place. Damage to the brain is permanent. It is quite possible for a person with a severe brain injury to show no outward physical signs of a disability. Cognitive abilities such as memory, abstract thinking, attention, and judgement can all be seriously and permanently affected in the absence of physical injuries.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Myth: A younger child will have a better outcome from a brain injury than an older student.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Even though a young child's brain has more plasticity and a greater ability for other neurons to take on new function, the brain is less developed overall and the child has less pre-existing knowledge (including life experiences and skills) to help them adjust to the consequences associated with a brain injury.</td>
</tr>
</tbody>
</table>
Acquired Brain Injury (ABI) is any type of sudden injury that causes temporary or permanent damage to the brain. ABI can be divided into two categories:

**Traumatic**: resulting from an external force applied to the head/brain (e.g., damage that is associated with some kind of trauma to the head, such as a concussion, a fall or a motor vehicle collision, is known as a traumatic brain injury.)

**Non-Traumatic**: resulting from an internal source that inflicts injury to the brain (e.g., anoxia [near drowning], toxicity, infection or cerebral vascular accident [stroke].)

The following chart provides examples of the most common causes of ABI.

<table>
<thead>
<tr>
<th>Cause</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Traumatic</strong></td>
<td></td>
</tr>
<tr>
<td>Blow to the head</td>
<td>- Motor vehicle accidents</td>
</tr>
<tr>
<td></td>
<td>- Assault with an object</td>
</tr>
<tr>
<td></td>
<td>- Shaken baby syndrome</td>
</tr>
<tr>
<td>Falling or tumbling</td>
<td>- Falling off a bicycle, tree,</td>
</tr>
<tr>
<td></td>
<td>climbing equipment or furniture</td>
</tr>
<tr>
<td></td>
<td>- Sports injuries</td>
</tr>
<tr>
<td><strong>Non-Traumatic</strong></td>
<td></td>
</tr>
<tr>
<td>Anoxic injuries (lack of</td>
<td>- Near drowning</td>
</tr>
<tr>
<td>oxygen to the brain)</td>
<td>- Suffocation</td>
</tr>
<tr>
<td></td>
<td>- Choking</td>
</tr>
<tr>
<td>Vascular injuries</td>
<td>- Stroke (blocked blood vessels in the</td>
</tr>
<tr>
<td>(disruption in blood</td>
<td>brain)</td>
</tr>
<tr>
<td>supply to the brain)</td>
<td>- Aneurysm (broken blood vessel in the</td>
</tr>
<tr>
<td></td>
<td>brain)</td>
</tr>
<tr>
<td>Inhalation or ingestion of</td>
<td>- Sniffing glue, paint or carbon</td>
</tr>
<tr>
<td>toxic substances</td>
<td>monoxide</td>
</tr>
<tr>
<td></td>
<td>- Drug use</td>
</tr>
<tr>
<td>Infectious diseases</td>
<td>- Meningitis</td>
</tr>
<tr>
<td></td>
<td>- Encephalitis</td>
</tr>
</tbody>
</table>
### 2.3 - Traumatic Brain Injury

Traumatic Brain Injuries (TBI) can also be divided into two main categories: **open and closed**. By knowing whether or not a person sustained an open-head injury versus a closed-head injury, some predictions about severity, outcome and deficits can be made.

<table>
<thead>
<tr>
<th><strong>Open-Head Injuries</strong></th>
<th><strong>Closed-Head Injuries</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- The skull is penetrated.</td>
<td></td>
</tr>
<tr>
<td>- Brain tissue becomes exposed to the outside environment.</td>
<td></td>
</tr>
<tr>
<td>- Initially the person is susceptible to severe blood loss and infection.</td>
<td></td>
</tr>
<tr>
<td>- Damage is usually focal (localized) in nature making deficits easier to predict and identify.</td>
<td></td>
</tr>
<tr>
<td>- Skull remains intact.</td>
<td></td>
</tr>
<tr>
<td>- Brain tissue is jolted around the inside of the skull.</td>
<td></td>
</tr>
<tr>
<td>- The brain is bruised and swells (edema), blood vessels are ruptured, causing blood build-up (hematomas), both of which cause further damage.</td>
<td></td>
</tr>
<tr>
<td>- Even through there may be only one initial point of impact, damage is global (diffuse) in nature, affecting many areas of the brain.</td>
<td></td>
</tr>
</tbody>
</table>

The mechanism of an open-head injury is fairly simplistic. An open wound in the brain, perhaps due to a gunshot or a knife, causes direct damage to the tissue. The mechanism of the closed-head injury is a little more complicated. When the head receives a blow, the brain is jolted inside the skull. If the blow is strong enough the brain can "bang" against the inner wall of the skull, resulting in what is termed a "coup" injury. This can cause a contusion or bruise, at this initial point of impact. It is then possible for the brain to rebound off the opposite side of the skull. This will cause yet another contusion on the opposite side of the brain, known as a...
“contracoup” injury. Depending on the force of the initial blow to the head, this rebounding effect on the brain can occur several times. With each back and forth motion of the rebounding effect, the brain is also being scraped back and forth across the bony, spike-like contours of the skull, causing bleeding and further tissue damage.
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**Secondary Factors**

In addition to the more prominent localized injuries at the coup and contracoup injuries, the sudden starting and stopping motions of the head and brain (sometimes called acceleration and deceleration forces), as well as the rotational and shearing movements caused as the brain twists upon itself at the level of the brain stem, typically also result in a pattern of diffuse (widespread) damage to the neurons and blood vessels.

**Hematomas**

The brain is supplied with blood through an extensive network of arteries and blood vessels. When the brain has been impacted, many blood vessels may be ruptured. This causes excessive bleeding, leading to the formation of hematomas, or pools of blood on or in the brain.

**Edema**

Brain tissue is similar to other bodily tissues in that damaged tissue results in swelling or edema. Unfortunately, since the brain is encased inside the hard skull, there is very little room for the tissue to swell. Therefore, the swelling brain tissue becomes squished or compressed up against the inside of the skull, causing damage and cutting off local blood supply. Without blood supply, the neurons contained in the swelled tissue can die.
Disconnection of the Neural Pathways

The brain is an interconnected network of neurons that communicate with each other. Neurons pass information from one to another, both electrically and chemically, along fragile axonal fibres. Neurons don’t actually touch, so they need only to be knocked out of alignment and there will be a disruption in the signal transfer. Neurons thrive on being active and their survival depends on it. If one group of neurons becomes damaged and dies, then the neurons that they once communicated with will no longer receive information. Once those neurons are no longer receiving information from the damaged neurons, they can become inactive and die as well.
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2.4 - Mild, Moderate and Severe Injuries

As a means of standardization, professionals have devised 3 categories of ABI to help describe the severity of the injury. These three categories are Mild, Moderate and Severe. The categories are principally determined by the degree of change in the individual's level of consciousness and the extent of Post Traumatic Amnesia (PTA).

Despite these definitions it is important to realize that any brain injury has the potential to affect the way a person lives, learns and interacts with others.

It is important to note that a person does not need to lose consciousness to sustain a brain injury.

In addition, it is important to note that the level of severity is not an entirely reliable predictor of outcomes.
The following chart highlights some of the possible symptoms of the three categories of ABI.

<table>
<thead>
<tr>
<th>Symptoms of a Mild Brain Injury (one or more of the following):</th>
<th>Symptoms of a Moderate Brain Injury (one or more of the following):</th>
<th>Symptoms of a Severe Brain Injury (one or more of the following):</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Altered state of consciousness at onset</td>
<td>- Loss of consciousness</td>
<td>- Coma/loss of consciousness exceeding 24 hrs</td>
</tr>
<tr>
<td>- Typically good physical recovery</td>
<td>- Seizures may occur</td>
<td>- May often be accompanied by multiple physical injuries</td>
</tr>
<tr>
<td>- Can have a negative CT scan or MRI</td>
<td>- Frequent headaches</td>
<td>- Frequent headaches</td>
</tr>
<tr>
<td>- Frequent headaches</td>
<td>- Motor coordination difficulties</td>
<td>- Decreased ability or an inability to control spontaneous movement</td>
</tr>
<tr>
<td>- Some poor motor coordination</td>
<td>- Limited attention span and/or concentration</td>
<td>- Limited attention span, concentration and/or inconsistent ability to attend to a stimuli</td>
</tr>
<tr>
<td>- Limited attention span and/or concentration</td>
<td>- Disruption of recall</td>
<td>- Limited ability or inability to voluntarily swallow</td>
</tr>
<tr>
<td>- Disruption of recall</td>
<td>- Limited attention span, concentration and/or ability to attend to multiple aspects of the environment</td>
<td>- Decreased level of consciousness</td>
</tr>
<tr>
<td>- Slowed information processing speed</td>
<td>- Memory retrieval and/or encoding complications</td>
<td>- Slowed information processing speed</td>
</tr>
<tr>
<td>- Problems with “working” memory (conscious, on-line thinking)</td>
<td>- Slowed information processing speed</td>
<td>- Problems with “working” memory (conscious, on-line thinking)</td>
</tr>
<tr>
<td>- Inability to organize</td>
<td>- Problems with “working” memory (conscious, on-line thinking)</td>
<td>- Inability to organize</td>
</tr>
<tr>
<td>- Inconsistent communication skills, including word finding problems and poor pragmatics</td>
<td>- Inconsistent communication skills, including word finding problems and poor pragmatics</td>
<td>- Inconsistent communication skills, including word finding problems and poor pragmatics</td>
</tr>
<tr>
<td>- Inappropriate social judgement and/or interactions</td>
<td>- Inappropriate social behaviour</td>
<td>- Inappropriate social behaviour</td>
</tr>
<tr>
<td></td>
<td>- Central sensorial complications</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Poor transfer of information between modalities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Limited generalization of learned information or skills</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Concrete thinking, inflexible thinking and reasoning, contextually based behaviour.</td>
<td></td>
</tr>
</tbody>
</table>

Note: 10% of all people with a mild brain injury experience lifetime problems with living and learning

Note: 33% of all people with a moderate brain injury experience lifetime problems with living and learning

Note: 90% of all people with a severe brain injury experience lifetime problems with living and learning
2.5 - Damage at Specific Stages During Child Development

In addition, pre-injury skills and abilities can mask other current, functional inequalities and the impact of the injury will go unnoticed.

- The developmental process of a child and of the brain involves the maturation of psychological and neurological systems within the brain and if brain structures suddenly become damaged, the natural developmental process will be interrupted.
- Since certain skills and the level of maturation are dependent upon developmental stages, the impact that ABI has on an individual will vary according to chronological age. There are 5 peak maturation periods that occur during development: ages 1-6, 7-10, 11-13, 14-17, and 18-21.
- Often in children, skills that were acquired before the injury will be maintained; however, the ability to acquire new skills will be impeded, sometimes halting them in a certain developmental stage.
- Deficits that result from an injury occurring at an early age, may not emerge until the student is much older and at a developmental age where those skills are needed, (e.g., a student acquiring an injury to the frontal lobe at age 5 may not show deficits until age 12 or older when more sophisticated cognitive skills such as problem solving, judgement, and the ability to organize and prioritize are required.)
### Potential Consequences of ABI: A Developmental Perspective

<table>
<thead>
<tr>
<th>Age in Years</th>
<th>Normal Developmental Expectations</th>
<th>Possible Consequences that can Result after ABI</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2</td>
<td>Behavioural</td>
<td>- Lack of neural sorting can result in disruption in all phases of development, including motor/physical, emotional, communication and social.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Poor coordination of limbs for gross motor control.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Lack of precision with fine motor skills as in finger manipulation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Limits in receptive language.</td>
</tr>
<tr>
<td></td>
<td>Neurological</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Radial cells guide the formation of neuron connections. There is an increased rate of re-sorting and elimination of neurons (parsing).</td>
</tr>
</tbody>
</table>

*Note: None of the above “possible consequences” is, by itself, a reliable indication of an ABI.*
### Potential Consequences of ABI: A Developmental Perspective (Con’t)

<table>
<thead>
<tr>
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<th>Possible Consequences that can Result after ABI</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-5</td>
<td>Behavioural</td>
<td>- Child may not play well with others and remain very self-focused.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Expressive language may remain very limited.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- May have difficulty understanding cause and effect relationships.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- May experience “temper tantrums” over relatively small issues and over time not appear to learn how to handle her/his emotions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- May experience severe separation anxiety when away from parents.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Long-term capacity for learning can be impaired after ABI since the brain has not developed adequate compensatory strategies.</td>
</tr>
</tbody>
</table>

- Formation of basic appropriate social interactions (e.g., share and play well with others).
- Expressive language formation.
- Learn basic aspects of personal care (e.g., washing and dressing).
- Control over some emotional and behavioural expressions.
- Separates comfortably from parents for short periods of time and is able to be productive.
- Pre-operational thought and problem-solving skills begin to emerge for cause and effect relationships and comprehension.

Neurological
- Time of rapid expansion of the connections between neurons (e.g., ability to learn is accelerated).

**Note:** None of the above “possible consequences” is, by itself, a reliable indication of an ABI.
Potential Consequences of ABI: A Developmental Perspective (Con’t)

<table>
<thead>
<tr>
<th>Age in Years</th>
<th>Normal Developmental Expectations</th>
<th>Possible Consequences that can Result after ABI</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-9</td>
<td>Behavioural</td>
<td>Possible Consequences that can Result after ABI</td>
</tr>
<tr>
<td></td>
<td>- Development of self-awareness begins and impact of one’s actions on others is recognized.</td>
<td>- One of the least devastating times for an injury to occur in terms of long-term prognostic outcome due to fact that much language learning has occurred, as well as some basic acquired skills in basic academic areas and social/emotional domains.</td>
</tr>
<tr>
<td></td>
<td>- Development of concrete operations (e.g., awareness of visual-spatial features in the environment, uses an empirical/experimental approach to discover relationships between objects and/or people).</td>
<td>- Difficulties in impulse control may present as distractibility and attention deficit and/or may be hyperactive in terms of not being able to inhibit movement and/or interactions.</td>
</tr>
<tr>
<td></td>
<td>Neurological</td>
<td>- Difficulty with behavioural management problems, often considered a “difficult” child.</td>
</tr>
<tr>
<td></td>
<td>- Most neurological development is complete with the exception of the frontal, hippocampal and some temporal areas.</td>
<td>- Misunderstanding object relations (e.g., can solve the world experimentally), therefore, gets very frustrated with outcomes she/he did not “predict.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- This can result in a child who “grows up” and appears lazy, unmotivated, detached, unresponsive, no “initiative.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Lack of empathy, due to lack of alternative perspectives, returns to egocentric perspective.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Inability to respond in expected manner to behaviour modification and consequences for actions due to decreased comprehension and/or perception of cause and effect relationships.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Inability to understand/formulate alternative points of view.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Disruption in moral understanding.</td>
</tr>
</tbody>
</table>

Note: None of the above “possible consequences” is, by itself, a reliable indication of an ABI.
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### Potential Consequences of ABI: A Developmental Perspective (Con’t)

<table>
<thead>
<tr>
<th>Age in Years</th>
<th>Normal Developmental Expectations</th>
<th>Possible Consequences that can Result after ABI</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-15</td>
<td>Behavioural</td>
<td>- Inappropriate social interactions among peers.</td>
</tr>
<tr>
<td></td>
<td>- Learning appropriate social interactions with peers of opposite sex begins.</td>
<td>- Student has problems with time management, attention, judgement, initiation or processing speed.</td>
</tr>
<tr>
<td></td>
<td>- More emphasis and expectations are placed on using executive cognitive functions (e.g., memory, problem solving, sequencing and judgement).</td>
<td>- Low self-esteem.</td>
</tr>
<tr>
<td></td>
<td>- Work well with others in group settings and/or with little supervision.</td>
<td>- Does not work well with others or when there is little structure.</td>
</tr>
<tr>
<td></td>
<td><strong>Neurological</strong></td>
<td>- Low self-control.</td>
</tr>
<tr>
<td></td>
<td>- Hormonal influences on the brain begin to occur.</td>
<td>- Poor memory, with limited recognition and recall for post-injury and recently experienced events.</td>
</tr>
<tr>
<td></td>
<td>- Connection between the two cerebral hemispheres becomes optimized.</td>
<td>- Interruption of pragmatic skills.</td>
</tr>
<tr>
<td></td>
<td>- Increasingly complex neuron interconnections ease learning in areas such as reading, spelling, writing, math and reasoning.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Development is completed for hippocampal and temporal areas towards the end of this stage.</td>
<td></td>
</tr>
</tbody>
</table>

*Note: None of the above “possible consequences” is, by itself, a reliable indication of an ABI.*
## Potential Consequences of ABI: A Developmental Perspective (Con’t)

<table>
<thead>
<tr>
<th>Age in Years</th>
<th>Normal Developmental Expectations</th>
<th>Possible Consequences that can Result after ABI</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-25</td>
<td>Behavioural</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Young adulthood phase of</td>
<td>- Apparent lack of interest and lethargy, “attitude,” lack of drive.</td>
</tr>
<tr>
<td></td>
<td>adolescent application and</td>
<td>- Awkward and/or inappropriate social-personal expression.</td>
</tr>
<tr>
<td></td>
<td>exercise of formal cognitive</td>
<td>- Inability to inhibit instincual drives in order to permit concentration in academic as opposed to social priorities.</td>
</tr>
<tr>
<td></td>
<td>thought (e.g., consideration of multiple variables influencing prediction and outcome).</td>
<td>- Perseveration of thought (e.g., being “stuck” on a particular item, idea and/or concern).</td>
</tr>
<tr>
<td></td>
<td>Flexibility in cognitive</td>
<td>- Lack of attention to detail, will overlook and/or not detect objects, items, facts, or variables that are relevant to decision making and/or action.</td>
</tr>
<tr>
<td></td>
<td>thought enhanced (e.g., being able to shift and test hypotheses rapidly and effectively based on feedback from the environment).</td>
<td>- Limited emotional control, may appear depressed, angry, volatile.</td>
</tr>
<tr>
<td></td>
<td>Increased sophistication of</td>
<td>- Lack of insight, limited social judgement and decision making.</td>
</tr>
<tr>
<td></td>
<td>being able to adapt and</td>
<td>- Disruption in organizational skills (e.g., planning, sequencing, predicting, anticipating) and other “executive” functions.</td>
</tr>
<tr>
<td></td>
<td>predict alternative</td>
<td>- Brain region “specific” disorders (e.g., parietal injury - spatial disruption, temporal - language disruption, occipital - disruption in vision).</td>
</tr>
<tr>
<td></td>
<td>perspectives (e.g., how</td>
<td></td>
</tr>
<tr>
<td></td>
<td>things affect others, how</td>
<td></td>
</tr>
<tr>
<td></td>
<td>others learn, how other</td>
<td></td>
</tr>
<tr>
<td></td>
<td>outcomes may occur and how</td>
<td></td>
</tr>
<tr>
<td></td>
<td>others will react to those</td>
<td></td>
</tr>
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<td></td>
<td>outcomes).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increased reliance on and</td>
<td></td>
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<tr>
<td></td>
<td>identification with peers in</td>
<td></td>
</tr>
<tr>
<td></td>
<td>social choices, judgement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>and modelling of behaviour;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>increased social interactions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>and contact; increased</td>
<td></td>
</tr>
<tr>
<td></td>
<td>independence from familial</td>
<td></td>
</tr>
<tr>
<td></td>
<td>support and judgement.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Social-personal relations and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>learning emphasized (e.g.,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>sexuality, intimacy).</td>
<td></td>
</tr>
</tbody>
</table>

**Neurological**
- Frontal lobe development is completed.
- Completion of neural myelination (e.g. insulation of the neural axons) takes place, thus increasing efficiency and communication within the neural systems.

*Note: None of the above “possible consequences” is, by itself, a reliable indication of an ABI.*
Educating Educators

An ABI is usually diagnosed by the treating physicians in the hospital emergency department, or by the family doctor. However, in the midst of other injuries (physical or life-threatening) a traumatic brain injury can easily be overlooked. In addition, more subtle or mild brain injuries may not be detectable during a basic neurological exam or even on extensive medical scans (CAT or MRI).

Many students who suffer a mild brain injury return to school without a proper diagnosis or follow-up. Worse yet is the fact that the family may, for a variety of reasons, fail to inform the school of the student’s ABI. Even if they do inform the educator, there is no obligation to enter that information in the permanent school records. In cases when the student appears to totally recover from the symptoms of the ABI as well as any physical injuries, the ABI is often totally forgotten by students and parents. The deficits resulting in ABI may manifest themselves several years post-injury when the student reaches a development stage which places new cognitive demands on them.

2.6 - Recovery and Long-Term Consequences

The unparalleled complexity of the brain makes it very difficult to determine the extent of the brain injury or the prognosis for recovery. There are many factors influencing the recovery process:

- **Characteristics of the injury** - The severity and extent of damage, the specific areas of the brain that are injured and the nature of the injury (focal or diffuse) all have a role in the student’s outcome.

- **Physical recovery of the brain** - There is some degree of spontaneous physical recovery following an ABI. Swelling decreases, normal blood flow is restored and since some reorganization of neural networks is possible, the brain can compensate for some types of impaired...
Students with ABI always have a potential for learning and benefiting from successes. The possibility of further improvement always remains for students with ABI, even once they have appeared to reach a plateau.

No head injury is too serious to be despised or too trivial to be ignored.
~ Hippocrates (400 B.C.)

**Resource Binder**

- The individual child - Characteristics of the student, including age and developmental stage at the time of the injury, her/his personality traits, pre-existing skills and knowledge, her/his history of learning or developmental difficulties and specific organization of the brain can all impact recovery positively or negatively.

- The environment - Informed and supportive family and friends and by extension, an informed and supportive school and community with availability and ready access to quality medical care and rehabilitation tailored specifically to the student’s individual needs are critical factors that will allow the achievement of the student’s full potential for recovery.

The speed and extent of recovery is variable. The greatest recovery and functional improvement is expected within the first 2 years post-injury and typically there is no long-term prognosis given until that time. Most of the spontaneous physical recovery of the brain is expected to occur within 1 year post-injury and generally gains occur more slowly after that time. In addition, some consequences of an ABI may not be noticeable until the child reaches a later developmental stage due to the fact that the injured part of the brain is not yet heavily relied upon. The younger the child is at the time of injury, the greater the impact will be on new learning, development and long-term outcome.
Educating Educators
Chapter 3

The Challenges of Working with ABI

3.1 Case Study - Classroom Behaviour
3.2 Functional/Behavioural Expectations in the Classroom
3.3 General Challenges in the Classroom Following ABI
3.4 Cognitive Challenges Following ABI
3.5 Behavioural/Emotional Challenges Following ABI
3.6 Physical Challenges Following ABI
3.7 Other Important Considerations Regarding Challenges in the Classroom
At 15, Chris was described by her teachers as a troublemaker. She refused to participate in any positive way for the nearly 2 years of her high school career. Persistently disruptive and oppositional behaviour, along with frequent truancy and fights with peers, had resulted in a school career made up mostly of suspensions. All of this later behaviour was in sharp contrast to the report cards from primary school, which described her as bright, co-operative, and popular.

Chris’ first 2 weeks in a new school proved to be the full horror show that the previous school had predicted. Chris had no intention of engaging in any classroom work. Her attitude when she went to class, which wasn’t often, was one of total defiance. Any attempt to ease her into the activities of the class was met with an outburst of screaming and profanity, followed by a rapid exit from the classroom. Chris’ aggressive behaviour with her peers in the hallways and lunchrooms was making it very difficult to keep her in school.

A meeting with Chris’ grandmother revealed that she was just as out of control in her new home as she was in her new school. It was in the midst of this discussion that the grandmother reminisced about what a sweet little girl Chris had been in her early years and what a “complete devil she had turned out to be.” “In fact,” she said, “she’s never been the same since she was hit by the truck.” The collision had left her unconscious for an unspecified period of time with a broken arm and a lot of scrapes and bruises. Chris seemed to make a full recovery. However, she was not quite the same bubbly, inquisitive student that she had been before the accident. She was less active and frequently whiny. By the time she was in Grade 7, the moodiness had evolved into frequent outbursts, which only got worse with time.

The real tragedy for Chris was that her brain injury and the potential for impairment was never recognized. Once the broken arm and the scrapes and bruises were healed, the incident with the truck and the period of unconsciousness were forgotten. Certainly they were never recorded in any school record. The disability was not a factor in anyone’s planning for Chris because it was never recorded.
### 3.2 - Functional/Behavioural Expectations in the Classroom

<table>
<thead>
<tr>
<th>What Schools Value Most in Students</th>
<th>Potential Difficulties for Students with ABI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Attention</td>
<td>1. Attention</td>
</tr>
<tr>
<td>3. Initiation</td>
<td>3. Initiation</td>
</tr>
<tr>
<td>4. Processing Speed</td>
<td>4. Processing Speed</td>
</tr>
<tr>
<td>5. Abstract Thinking</td>
<td>5. Abstract Thinking</td>
</tr>
<tr>
<td>7. Memory</td>
<td>7. Memory</td>
</tr>
<tr>
<td>8. Reasoning</td>
<td>8. Reasoning</td>
</tr>
<tr>
<td>9. Strategic Thinking</td>
<td>9. Strategic Thinking</td>
</tr>
<tr>
<td>10. Self-Monitoring</td>
<td>10. Self-Monitoring</td>
</tr>
</tbody>
</table>

There are certain modes of interactions and/or behaviour that we attempt to nurture in students in order to enhance learning in a group setting. The most common behavioural tasks from a developmental and functional school perspective that students need to succeed are listed below.

1. Ability to listen appropriately to other speakers without interruptions.
2. Ability to share materials.
3. Display appropriate restraint regarding self-stimulation.
4. Use non-aggressive words or actions.
5. Accept unexpected changes in routine.
6. Refrain from provoking others.
What is difficult for the child with ABI is that since the injury affects many skill sets in terms of physical, emotional/social and cognitive domains, many, if not all, of these identified necessary skills are unavailable.

7. Hear constructive criticism without losing temper.
8. Use words rather than physical actions to respond when provoked or angry at others.
9. Seek adult assistance, if necessary, when experiencing peer conflict, especially conflicts involving violence.
10. Respond to/handle teasing in a constructive way.
11. Handle frustration when experiencing difficulties with school tasks/activities.
12. Show common sense in words and actions around bullies, gangs or strangers.
13. Maintain behavioural control in large groups of children (e.g., cafeteria, assemblies).
14. Resolve ordinary peer conflicts or problems adequately on her/his own without requesting educator assistance.
Challenges that students with ABI may face in the classroom occur on many different levels including:

**Cognitive** - e.g., limited attention, changes in perception, learning, remembering, reasoning, understanding.

**Behavioural/Emotional** - e.g., self-esteem (sense of competency/adequacy) inability to control response reactions, unaware of consequences/outcomes/predictions of actions on others, agitation, distractedness, impatience, lowered frustration tolerance, trauma responses/behaviour; social interaction - e.g., reintegration with family and peers, inability to readily/smoothly manage transitions between the home and school (change in rules, schedules, people, comforts/supports, acceptance).

**Physical** - e.g., pain/discomfort, lack of access or restrictions to classroom involvement, fatigue, seizures and sleep disruption.
3.4 - Cognitive Challenges Following ABI

Students who have experienced an injury to the head and brain may experience some or all of the following cognitive difficulties: (For more information, see Section 4.7)

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>What an Educator Might See</th>
</tr>
</thead>
</table>
| Acquisition of new knowledge | - Struggles with new schoolwork despite prior history of ability  
- Islands of preserved high level knowledge may convey overly optimistic picture of the student's level to both student and educator  
- Inconsistency in learning rates  
- Since the student is accustomed to pre-injury success, she/he may not be able to recognize or acknowledge current inferior performance  
- Difficulty keeping up with the class  
- Inability to process information at the regularly delivered rate  
- Inability to produce responses at the regularly expected rate (late homework, incomplete assignments) |

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>What an Educator Might See</th>
</tr>
</thead>
</table>
| Memory | - Difficulty comprehending new concepts or settings  
- Inability to learn from previous mistakes  
- Difficulty staying oriented to a schedule or to activities  
- Difficulty registering new information or words that have been learned, particularly when under stress  
- Failure to complete assignments because the task request, if not written or repeated several times, is not remembered  
- Need for extraordinarily large number of repetitions to learn simple motor sequences (e.g., tying shoes) classroom routines and rules and textbook information. |
## Cognitive challenges, continued...

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>What an Educator Might See</th>
</tr>
</thead>
</table>
| Organization         | - Difficulty generalizing information from large amounts of unstructured information  
                        - Late and/or consistently incomplete homework assignments  
                        - Difficulty analyzing a task into component parts, (i.e., breaking categories down into representative items of the category)  
                        - Inability to use different strategies to enhance comprehension (e.g., outlining the text, underlining key points, asking themselves questions as they read, discussing the text, objects into appropriate categories or groups and/or events into appropriate sequences) despite repeated teaching  
                        - Inability to sequence properly  
                        - Inability to gather required tools and/or information for a task  
                        - Total inability to adapt to change in routines |
| Attention and Concentration | - Inability to stay on task, pay attention; easily distracted by things in the environment  
                              - Difficulty maintaining attention; fragmented understanding of tasks  
                              - Inability to filter out environmental distractions or internal feelings or thoughts  
                              - May result in the student talking out of turn, introducing irrelevant topics or responding inappropriately  
                              - Difficulty shifting easily from one topic to another  
                              - Unexpected shifts from topic to topic in conversation because of an unusual set of associations; this may be interpreted as social strangeness or as a result of a lack of knowledge about the subject |
Cognitive challenges, continued...

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>What an Educator Might See</th>
</tr>
</thead>
</table>
| **Perception (Vision)** | - Difficulty seeing objects in part of the visual field  
- Difficulty perceiving the spatial orientation of objects  
- Difficulty separating the object of perception from background stimuli  
- Difficulty recognizing objects if too much is presented at once or too rapidly |
| **Perception (Auditory)** | - Misperceives speech sounds, leading to inability to formulate a response  
- Requires additional time for written or verbal responses  
- Unable to retrieve words  
- Difficulties in writing ability (e.g., exhibits messy or incomplete material) |
| **Reasoning** | - Inability to apply appropriate learning and solving strategies that have been taught  
- Difficulty understanding abstract levels of meaning (e.g., figures of speech, metaphors)  
- Difficulty drawing conclusions from facts presented  
- Difficulty considering hypothetical explanations for events  
- Difficulty perceiving the exact nature of a problem (e.g., cannot connect different, but similar, types of information or recognize patterns of information)  
- Inability to appreciate cause and effect relationship |
Cognitive challenges, continued...

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>What an Educator Might See</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem-Solving</td>
<td>- Inability to reason or understand different points of view</td>
</tr>
<tr>
<td></td>
<td>- Inability to break the task into parts and decide what to do first and next and so on</td>
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<tr>
<td></td>
<td>- Difficulty identifying and synthesizing information into larger units (e.g., main ideas or themes), therefore, unable to grasp/infer the major concept based on detailed information</td>
</tr>
<tr>
<td></td>
<td>- Inability to integrate the information to determine the main ideas and write a short summary</td>
</tr>
<tr>
<td></td>
<td>- Difficulty considering information relevant to solving the problems</td>
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<td></td>
<td>- Difficulty weighing the relative merits of alternative solutions</td>
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</table>

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>What an Educator Might See</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiation</td>
<td>- Inability to begin a task</td>
</tr>
<tr>
<td></td>
<td>- May be able to explain steps needed but unable to implement Step One</td>
</tr>
<tr>
<td></td>
<td>- May be unclear of the expectations, but will not initiate asking for assistance</td>
</tr>
<tr>
<td></td>
<td>- Often categorized as “lazy”</td>
</tr>
<tr>
<td></td>
<td>- Appears to be just staring off into space</td>
</tr>
</tbody>
</table>
Students who have experienced an injury to the head and brain may experience some or all of the following behavioural/emotional difficulties: (For more information, see Section 4.9)

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>What an Educator Might See</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frustration</td>
<td>- Gives up on tasks easily</td>
</tr>
<tr>
<td></td>
<td>- Becomes angry or agitated rather than trying a new approach or asking for help</td>
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<tr>
<td></td>
<td>- Seems unaware of sources of frustration</td>
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<tr>
<td></td>
<td>- Easily discouraged</td>
</tr>
<tr>
<td></td>
<td>- Less tolerance of noise and distraction</td>
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</table>

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>What an Educator Might See</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disinhibition</td>
<td>- Inappropriate remarks or behaviour of an aggressive or sexual nature</td>
</tr>
<tr>
<td></td>
<td>- Inability to self-monitor</td>
</tr>
<tr>
<td></td>
<td>- Rude/hurtful remarks</td>
</tr>
<tr>
<td></td>
<td>- Disregard of safety rules</td>
</tr>
<tr>
<td></td>
<td>- Problems interpreting social rules</td>
</tr>
<tr>
<td></td>
<td>- Mood swings, irritation, frustration, verbal or physical outbursts</td>
</tr>
</tbody>
</table>
Behavioural/emotional challenges, continued...

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>What an Educator Might See</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggression</td>
<td>- Hits others</td>
</tr>
<tr>
<td></td>
<td>- Verbally/physically threatening</td>
</tr>
<tr>
<td></td>
<td>- Difficulty self-monitoring</td>
</tr>
<tr>
<td></td>
<td>- Swearing</td>
</tr>
<tr>
<td></td>
<td>- Destruction of property</td>
</tr>
<tr>
<td>Depression</td>
<td>- Withdrawn/quiet</td>
</tr>
<tr>
<td></td>
<td>- Lack of interest in appearance</td>
</tr>
<tr>
<td></td>
<td>- Expresses feelings of hopelessness</td>
</tr>
<tr>
<td></td>
<td>- Overly focussed on negative</td>
</tr>
<tr>
<td></td>
<td>- Unable to see positive qualities in oneself</td>
</tr>
<tr>
<td>Initiation</td>
<td>- Failure to begin assignments</td>
</tr>
<tr>
<td></td>
<td>- Ability to verbalize task but not begin</td>
</tr>
<tr>
<td></td>
<td>- Needs prompting</td>
</tr>
<tr>
<td></td>
<td>- Appears disinterested</td>
</tr>
<tr>
<td></td>
<td>- Lack of response through generation of ideas, response to questions</td>
</tr>
</tbody>
</table>
## Behavioural/emotional challenges, continued...

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>What an Educator Might See</th>
</tr>
</thead>
</table>
| Poor self-image      |  - Inability to see positive qualities in oneself  
|                      |  - Focus on limitations  
|                      |  - Withdrawal from others  
|                      |  - Inability to act due to fear of failure  
|                      |  - Appears unmotivated |

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>What an Educator Might See</th>
</tr>
</thead>
</table>
| Poor social behaviour|  - Misreads social cues  
|                      |  - Overly sexually aggressive  
|                      |  - Overwhelmed around other persons, irritable, distressed frustrated  
|                      |  - Seeming little consideration for the feelings of others  
|                      |  - Limited/faulty interpretation of other people's behaviour, actions or words |
3.6 - Physical Challenges Following ABI

Students who have experienced an injury to the head and brain may experience some or all of the following physical and/or motoric difficulties: (For more information, see Section 4.10)

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>What an Educator Might See</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster headaches:</td>
<td></td>
</tr>
<tr>
<td>- Migraine-like</td>
<td>- Interference with ability to attend to class instruction and/or participate</td>
</tr>
<tr>
<td>neurological pains</td>
<td>- Irritability, distractedness</td>
</tr>
<tr>
<td>of the head</td>
<td>- Fatigue</td>
</tr>
<tr>
<td>- Often minimally</td>
<td></td>
</tr>
<tr>
<td>managed and treated</td>
<td></td>
</tr>
<tr>
<td>Tension headaches:</td>
<td></td>
</tr>
<tr>
<td>- Throbbing, tightness pain; can be treated through muscle relaxation procedures</td>
<td></td>
</tr>
<tr>
<td>Tinnitus:</td>
<td></td>
</tr>
<tr>
<td>- Ringing/buzzing</td>
<td>- Physical discomfort</td>
</tr>
<tr>
<td>sound in the ears</td>
<td>- “Antsiness,” restlessness</td>
</tr>
</tbody>
</table>

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Physical challenges, continued...

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>What an Educator Might See</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Fatigue (&quot;Brain Drain&quot;):</td>
<td>What an Educator Might See</td>
</tr>
<tr>
<td>- The sense that no further information can be processed</td>
<td>- Daydreaming-like/dazed appearance</td>
</tr>
<tr>
<td>- Cloudy feeling in head; cognitively overwhelmed</td>
<td>- Eyes unable to focus; pale</td>
</tr>
<tr>
<td>- Attempts to leave the setting</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>What an Educator Might See</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual field neglect:</td>
<td>Unable to detect information, items, objects in a part of their visual field; therefore, wait, read the whole blackboard or text, wait, use the whole page when writing on a sheet</td>
</tr>
<tr>
<td>- Inability to perceive a segment of the visual environment</td>
<td>- Will not adjust movement of body to compensate for the environment [e.g., will trip over backpack straps absent-mindedly]</td>
</tr>
<tr>
<td>- Usually lateralized (e.g. involves the right or left visual field)</td>
<td>- Will look drunk or impaired or awkward</td>
</tr>
<tr>
<td>Impaired visual scanning ability:</td>
<td></td>
</tr>
<tr>
<td>- An inability to move eyes thoroughly throughout one's visual environment (look all around)</td>
<td></td>
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</tbody>
</table>
Physical challenges, continued...

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>What an Educator Might See</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seizures ranging from:</td>
<td>- Cannot process information, therefore cannot encode/learn during these episodes</td>
</tr>
<tr>
<td>- Grand mal - clonic and/or tonic movement of skeletal muscles to petit mal/absence (mild twitching of individual muscle group(s) and/or lack of processing for brief episodes)</td>
<td>- Maybe emotionally disturbing for the student upon re-emergence</td>
</tr>
<tr>
<td>- In both cases there is spontaneous unintentional and uncontrollable synchronous firing of neurons which often times have unpredictable triggers/onsets</td>
<td>- Need for reorientation to person, place and time</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>What an Educator Might See</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Fatigue</td>
<td>- Lack of physical or mental energy</td>
</tr>
<tr>
<td></td>
<td>- Listlessness, yawning</td>
</tr>
<tr>
<td></td>
<td>- Unalert, unaroused</td>
</tr>
</tbody>
</table>

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**Physical challenges, continued...**

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>What an Educator Might See</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Care:</td>
<td>Unkempt appearance</td>
</tr>
<tr>
<td>Toileting, eating,</td>
<td>Mismatched clothing</td>
</tr>
<tr>
<td>carrying a cafeteria</td>
<td>Obvious personal hygiene</td>
</tr>
<tr>
<td>tray, changing for gym</td>
<td>deficiencies</td>
</tr>
<tr>
<td>class, putting on</td>
<td></td>
</tr>
<tr>
<td>coat/boots,</td>
<td></td>
</tr>
<tr>
<td>transferring from</td>
<td></td>
</tr>
<tr>
<td>wheelchair,</td>
<td></td>
</tr>
<tr>
<td>administering</td>
<td></td>
</tr>
<tr>
<td>medications</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>What an Educator Might See</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility:</td>
<td>Lateness for class</td>
</tr>
<tr>
<td>Moving from class to</td>
<td>Problems with balance</td>
</tr>
<tr>
<td>class, manoeuvring in</td>
<td>Inability to access</td>
</tr>
<tr>
<td>the halls during busy</td>
<td>classrooms, washrooms,</td>
</tr>
<tr>
<td>times, playground</td>
<td>cafeteria, upper levels of</td>
</tr>
<tr>
<td>equipment</td>
<td>school</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>What an Educator Might See</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine Motor:</td>
<td>Messy work</td>
</tr>
<tr>
<td>Use of writing</td>
<td>Incomplete work</td>
</tr>
<tr>
<td>implements.</td>
<td>Inability to complete on time</td>
</tr>
<tr>
<td></td>
<td>Failure to engage in some tasks</td>
</tr>
</tbody>
</table>
3.7 - Other Important Considerations Regarding Challenges in the Classroom

Medical and Health Issues

Educators need to remember that students with ABI may have complicated medical and health needs. Many times, changes in behaviour are related to health care issues (i.e. decreased sleep, increased tantrum behaviour). Students often exhibit increased behaviours during times of illness due to infections, seizure activity, fluctuations in hormone levels, etc., in addition to other social factors such as loss of time from school and learning, reduced contact with others and changes in schedule.

A student’s brain is a developing organ. As a result, occasionally as the student gets older, new symptoms appear even years after the brain injury. Other students may have chronic pain from injuries. Physical and occupational therapies or recreational activities may exacerbate chronic pain and decrease ability to maintain positive behavioural functioning. ABI students often complain of nagging headaches that could interfere with attention and concentration and lead to frustration and agitation.

Many students with ABI take medications and these medications can have side effects (e.g., drowsiness or fatigue, slow thinking, and inability to handle multiple pieces of information). Knowing what the medication is used for and its side effects can help educators plan accordingly and schedule them (meds) into the daily routine.
Young students with ABI may have injured a part of the brain whose associated function matures later in development. These students may appear to have returned to normal soon after the injury, but later they experience substantial difficulty because the brain interferes with the development of the function that needs to mature (i.e., executive functions).

Adolescence is a difficult period of adjustment for non-disabled young adults. Most adolescents are looking forward to the future with anticipation. When a brain injury occurs during this time period, it greatly affects the person’s ability to cope with a dramatic shift in her/his life.
Chapter 4
Working with ABI in the School Setting

4.1 Case Study
4.2 Myths and Misconceptions
4.3 Learning Disabilities (LD) vs. Acquired Brain Injury (ABI)
4.4 Deciding on Appropriate Strategies
4.5 The Process for Developing Strategies
4.6 General Strategies for Educators
4.7 Cognitive Impairments
4.8 Cognitive Skills and Strategies
4.9 Behavioural/Emotional Impairments
4.10 Behavioural/Emotional Skills and Strategies
4.11 Physical Impairments
4.12 General Skills and Strategies
When Gary was hit by a truck at age 5, his family was told that if he survived it would likely be in a near-vegetative state. His family refused to accept that prognosis.

By age 15, largely through the dogged determination of his mother, Gary was walking (with a limp), talking (incessantly but coherently), reading with comprehension, and able to do simple mathematical computation. He had a prodigious memory about a few topics which he often inserted quite inappropriately into unrelated discussions. He was a very eager and fiercely competitive participant in sporting activities.

Gary’s biggest challenge was appropriate social interaction with both peers and adults. He would often attempt to threaten or bully others, assuming the persona of a superhero or pro-wrestler, which made him appear quite ridiculous and left him the brunt of derision which, of course, only exacerbated the problem.

After several incidents and meetings with his parents, it was decided that his mother would meet with the staff and Gary’s classmates to explain his disability and teach others how to diffuse the aggression by deflecting his attention to another activity.

Following the discussion, a typical scenario that would have previously resulted in havoc came to play out as follows:

Gary: (with lots of machismo) “I’m Hulk Hogan and I’m going to rip you apart.”
Classmate: “Let’s see if we can get a basketball and play three and out.”
Gary: “OK. I get first shot.”
4.2 - Myths and Misconceptions

**Myth:** Once a strategy is taught the students will use it independently.

**Fact:** Strategy instruction must be consistent and ongoing. One cannot assume that the successful use of a strategy will result in that same strategy being generalized to a different setting or subject area. It may often be the case that students with ABI will fail to use a strategy taught even when attempting the same task just accomplished.

**Myth:** A child that can verbalize a strategy can do a strategy.

**Fact:** While a student with ABI may be able to verbalize the correct set of strategies and or actions to be used in a particular circumstance or in attempting a particular task, it does not ensure that they will be able to carry out the activity utilizing the previously stated strategic approach. Other students will experience what is termed Failure to Initiate, which will result in a student being able to verbalize what needs to be done but unable to begin the activity.

4.3 - Learning Disabilities (LD) vs. Acquired Brain Injury (ABI)

While many of the strategies and teaching practices used with students who have learning disabilities (LD) may be effective when used with students who have ABI, it is often the case that particular strategies, commonly utilized effectively with the learning disabled population, can cause great frustration with students who have sustained an ABI.

For this reason it is important to distinguish between the two conditions. Perhaps the most striking way in which ABI is different from LD relates to onset. For students who have been diagnosed with a learning disability, the difficulties in learning and/or socialization have been present from a very early age. It is often the case that in schools difficulties are noted early in a student’s school career only to become more apparent as the curricular demands become more complex throughout the primary and early elementary years.
In the case of ABI, a student’s performance prior to the injury will have indicated no difficulties in learning (with the exception, of course, of those instances where a student, prior to the injury, had a pre-existing condition). The onset of ABI is sudden and may be dramatic. A student, previously successfully dealing with the academic and social demands of schooling, may suddenly experience difficulties in areas that presented little challenge prior to the injury. These new and sudden challenges often erode the student’s self-image.

Coupled with this sudden onset, the difficulty of ascertaining the student’s ability to learn post-injury will be complicated by the existence of pockets of pre-injury knowledge that will be intact and might indicate, falsely, to the educator that new learning will proceed without difficulty.

Students with ABI may also have to deal with a number of factors that might affect learning, particularly in the early post-injury stage. These will include:

- Drowsiness
- Mood swings
- Fatigue
- Muscle pain
- Medication side effects
- Hearing and vision difficulty
- Vertigo and balance difficulties
- Seizure
- Headache
<table>
<thead>
<tr>
<th>Learning Disabilities vs. ABI</th>
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</thead>
<tbody>
<tr>
<td><strong>Onset</strong></td>
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<tr>
<td>Learning Disabilities</td>
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<tr>
<td>Acquired Brain Injury</td>
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<tr>
<td><strong>Cause</strong></td>
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<tr>
<td>Learning Disabilities</td>
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<tr>
<td>Acquired Brain Injury</td>
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<tr>
<td><strong>Neurologic Changes</strong></td>
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<tr>
<td>Learning Disabilities</td>
</tr>
<tr>
<td>Acquired Brain Injury</td>
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<tr>
<td><strong>Functional Changes</strong></td>
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<tr>
<td>Learning Disabilities</td>
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<tr>
<td>Acquired Brain Injury</td>
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<tr>
<td><strong>Cognitive Changes</strong></td>
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<tr>
<td>Learning Disabilities</td>
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<tr>
<td>Acquired Brain Injury</td>
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<tr>
<td><strong>Sensory/Perceptual Change</strong></td>
</tr>
<tr>
<td>Learning Disabilities</td>
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<tr>
<td>Acquired Brain Injury</td>
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<tr>
<td><strong>Physical Changes</strong></td>
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<tr>
<td>Learning Disabilities</td>
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<tr>
<td>Acquired Brain Injury</td>
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<tr>
<td><strong>Emotional Changes</strong></td>
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<tr>
<td>Learning Disabilities</td>
</tr>
<tr>
<td>Acquired Brain Injury</td>
</tr>
<tr>
<td><strong>Behavioural Changes</strong></td>
</tr>
<tr>
<td>Learning Disabilities</td>
</tr>
<tr>
<td>Acquired Brain Injury</td>
</tr>
<tr>
<td><strong>Awareness of Deficit</strong></td>
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<tr>
<td>Learning Disabilities</td>
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<tr>
<td>Acquired Brain Injury</td>
</tr>
<tr>
<td><strong>Social Interactions</strong></td>
</tr>
<tr>
<td>Learning Disabilities</td>
</tr>
<tr>
<td>Acquired Brain Injury</td>
</tr>
</tbody>
</table>
4.4 - Deciding on Appropriate Strategies

Since ABI has such subtle and varied manifestations, there is no set of strategies that will guarantee optimal learning for every student with ABI. Teachers who are attempting to help such a student will have to be creative, willing to experiment and extremely patient and forgiving, both with the student and themselves. Nevertheless, there are certain sets of strategies that have been shown to be effective with various cognitive/behavioural impairments.

When searching for strategies be sure to check with parents, previous teachers, rehabilitation specialists and most importantly, the students themselves to find out which strategies are effective as well as to ensure a consistency of strategy use across settings.

4.5 - The Process for Developing Strategies

- Identify the problem (Hypothesis Testing)
- Assist the student to take ownership of the problem
- Restructure the approach to a task
- Provide opportunities to rehearse and experience the strategy in a variety of environments
- Continually reinforce the successful strategies
- Frequently evaluate the effectiveness of the strategy and modify as necessary
4.6 - General Strategies for Educators

- Learn about acquired brain injury
- Forge home and school partnerships
- Provide cues and modelling to assist with initiation of assignments
- Assist the student to devise an effective method for homework completion
- Use repetition and review to aid in learning and memory
- Allow for frequent breaks during teaching sessions
- Offer a wide range of opportunities to learn new skills using different modalities
- Provide consistent routines and structure
- Control environmental stimulation
- Prepare ahead of time for transitions
- Teach organizational strategies
- Chunk information into manageable bits
- Accompany verbal instruction with written directions
- Do not assume that the student has, or is able to use the necessary prerequisite skill for a new task

4.7 - Cognitive Impairments

Students who have experienced an ABI are often left with cognitive impairments. These impairments can vary in nature and severity relative to the part of the brain that is injured and the amount of damage that has occurred. Students who are left with cognitive impairments will likely require special teaching and learning strategies to help them compensate for their cognitive deficit. Areas of cognitive functioning that may be affected to a greater or lesser extent include the following:
Educating Educators

- Acquisition of new knowledge
- Memory
- Organization
- Attention and concentration
- Perception
- Reasoning
- Problem-solving
- Initiation

The following section lists general strategies that have proven effective for each of these cognitive deficits. Please note that it cannot be emphasized too strongly that none of these are guaranteed. Educators must be willing to experiment until they find a combination of strategies that works for the individual. Furthermore, the strategies may vary over time as the student progresses through stages of recovery or through developmental stages.

It is also important to remember that many cognitive skills are interrelated. For example, difficulties with memory will result in organizational difficulties and attention problems will make the acquisition of new knowledge more of a challenge. Just as interrelationships exist between cognitive skills, so too does a relationship exist between the strategies utilized to assist students with ABI. While a strategy may be listed for memory, it may also be effective in organization and the acquisition of new knowledge. While strategies are listed separately, any and all can be used where effective.
Students with ABI will often return to school with previously learned knowledge relatively intact. A student who knew his or her multiplication tables at the beginning of Grade 3 may come to school following an injury with those times tables well established in his or her memory. Because of this, it may seem that the student will be ready and able to similarly acquire new information. For students with ABI, this is often not the case. (For more information, see Section 3.4)

### Challenge to Student

<table>
<thead>
<tr>
<th>Acquisition of new knowledge</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not assume prior learning but also do not assume that all knowledge and skills taught prior to injury are no longer present.</td>
<td>- Determine the students’ preferred learning style and instruct accordingly.</td>
</tr>
<tr>
<td>Present new material in small chunks.</td>
<td>- Present new material in small chunks.</td>
</tr>
<tr>
<td>Repeat information frequently and summarize it.</td>
<td>- Repeat information frequently and summarize it.</td>
</tr>
<tr>
<td>Offer a wide range of opportunities using different modalities to practice new skills.</td>
<td>- Offer a wide range of opportunities using different modalities to practice new skills.</td>
</tr>
<tr>
<td>When teaching new concepts include many relevant examples.</td>
<td>- When teaching new concepts include many relevant examples.</td>
</tr>
<tr>
<td>Make the material to be learned relevant and significant to the learner.</td>
<td>- Make the material to be learned relevant and significant to the learner.</td>
</tr>
<tr>
<td>Give meaning to rote data to enhance comprehension and learning.</td>
<td>- Give meaning to rote data to enhance comprehension and learning.</td>
</tr>
<tr>
<td>Employ frequent checks to ensure comprehension.</td>
<td>- Employ frequent checks to ensure comprehension.</td>
</tr>
<tr>
<td>Employ feedback sessions with the students to let them know how they are doing.</td>
<td>- Employ feedback sessions with the students to let them know how they are doing.</td>
</tr>
<tr>
<td>Reinforce information with a variety of visual/auditory aids.</td>
<td>- Reinforce information with a variety of visual/auditory aids.</td>
</tr>
<tr>
<td>Allow students additional time for review.</td>
<td>- Allow students additional time for review.</td>
</tr>
<tr>
<td>Involve students in planning a special activity to assist with practicing newly learned skills.</td>
<td>- Involve students in planning a special activity to assist with practicing newly learned skills.</td>
</tr>
<tr>
<td>Match learning style with instructional method.</td>
<td>- Match learning style with instructional method.</td>
</tr>
</tbody>
</table>
Educating Educators

Memory

Students with ABI will show memory deficits, not only in their ability to recall material but also more globally in their ability to function effectively within the demands of the school setting. They are often unable to complete homework and follow directions, as well as learn new information. (For more information, see Section 3.4)

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
</tr>
</thead>
</table>
| Memory               | - Provide relevant links for new information to prior knowledge  
|                      | - Utilize techniques such as the use of special words or examples as cues for information  
|                      | - Teach students to categorize or chunk information into smaller sections to aid in retention  
|                      | - Have students generate their own memory cues  
|                      | - Repetition  
|                      | - Create an environment where students do not have to rely heavily on memory  
|                      | - Teach students to use memory aids such as calendars, Post-It notes, check sheets, and assignment books  
|                      | - Encourage the use of a journal to assist students in keeping track and orienting themselves in a school environment  
|                      | - Create an assignment sheet for students to carry with them. A teacher or a "buddy" can ensure it is filled out after each class  
|                      | - Use visual cues  
|                      | - Utilize mnemonic strategies (e.g., HOMES = Huron, Ontario, Michigan, Erie, Superior to remember the Great Lakes).  
|                      | - Use rhyme, song, drill where appropriate  
|                      | - Chunk work into manageable pieces |
Within a school setting the ability to organize material learned as well as tasks assigned is an essential component of being a successful student. Students with organizational difficulties as a result of ABI will have difficulty completing such tasks as performing a task in sequence, keeping track of assignments, even following a schedule.

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
</tr>
</thead>
</table>
| Organization         | - Establish and maintain daily routines  
                      | - Provide written daily schedule for students to refer to and if necessary, review it at the beginning of each day  
                      | - Provide an outline that is coordinated with each class lecture and have the students make notes for each session  
                      | - Have frequent notebook checks and reorganization  
                      | - Keep a duplicate copy of handouts and materials for those students who misplace work  
                      | - Colour code all materials associated with each class  
                      | - Write a checklist of steps for completing complex tasks  
                      | - Provide outlines for written notes  
                      | - Break instruction down into simple steps and have students check off each step as it is completed  
                      | - Practice sequencing material, (e.g., routines for going outside at recess)  
                      | - Teach study skills  
                      | - Provide verbal encouragement cues after the completion of each step such as "good," "what would you do now?"  
                      | - Conduct feedback sessions with the students to let them know how they are doing  
                      | - With the agreement of the student or parent, assign a buddy or buddies to assist the student with such tasks as opening her/his locker, collecting the correct materials, keeping track of schedule  
                      | - Avoid scheduling classes in different parts of the building, where possible |
Students with ABI often need to work in environments that adults with brain injuries could not tolerate. Classrooms that are overly stimulating with continually shifting cognitive tasks are the norm in most schools. Students with attention and concentration difficulties respond best to structure or “brain injury-friendly” environments which allow for predictable, organized and consistent routines.

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
</tr>
</thead>
</table>
| Attention/Concentration | - Provide consistent, predictable, regular routines  
- Provide appropriate student work/study areas that limit distraction  
- Set up a "quiet" area where students can focus and calm down  
- Place student with ABI away from distracting areas such as the door and windows  
- Monitor student seating and take note of peers to see if being in close proximity with certain students increases or decreases certain behaviours  
- Emphasize interest  
- Recognize the signs of attentional drifts and be prepared to redirect as necessary  
- Signal when a shift of attention is required |
Resource Binder

**Perception**

Students with perceptual difficulties may be unable to recognize features and relationships among features such as print, three-dimensional objects and even orientation within the school. These perceptual problems may also exist within the auditory realm, leading to difficulties in perceiving spoken directions.

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
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</thead>
<tbody>
<tr>
<td>Perception (Vision)</td>
<td>- Check for too much visual stimulation. Are the classroom walls too busy?</td>
</tr>
<tr>
<td></td>
<td>- Keep visual space clutter-free</td>
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<tr>
<td></td>
<td>- Contrast postings to allow student to differentiate and pay attention to items of importance</td>
</tr>
<tr>
<td></td>
<td>- Separate out important information in print</td>
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<tr>
<td></td>
<td>- Use arrows and highlighters to orient the student</td>
</tr>
<tr>
<td></td>
<td>- Use multi-sensory presentation where possible</td>
</tr>
<tr>
<td></td>
<td>- Provide visual cues for directions when moving from room-to-room and practice with the student</td>
</tr>
<tr>
<td></td>
<td>- Post class schedule and class rules</td>
</tr>
<tr>
<td></td>
<td>- Post the student's individual schedule in an easily accessible place for individual use</td>
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<tr>
<td></td>
<td>- Keep closet doors closed and shelves covered when not in use</td>
</tr>
<tr>
<td></td>
<td>- Maintain for the student a tidy workspace that reduces distraction</td>
</tr>
<tr>
<td></td>
<td>- Be sure the student has an unobstructed view</td>
</tr>
<tr>
<td></td>
<td>- Provide repeated or longer viewing times</td>
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<tr>
<td></td>
<td>- Use an arrow or key word on page to direct student</td>
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<tr>
<td></td>
<td>- Consider the use of study carrels</td>
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</table>
## Perceiving (cont’d)

<table>
<thead>
<tr>
<th><strong>Challenge to Student</strong></th>
<th><strong>Strategies</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Perception (Auditory System)</td>
<td>- Keep classroom noise slightly below conversation level unless otherwise recommended for hearing</td>
</tr>
<tr>
<td></td>
<td>- Establish eye contact before speaking</td>
</tr>
<tr>
<td></td>
<td>- Highlight important words and instructions</td>
</tr>
<tr>
<td></td>
<td>- Use multi-sensory presentation where possible</td>
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<tr>
<td></td>
<td>- Be clear and specific with directions and check for understanding</td>
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<tr>
<td></td>
<td>- Obtain and maintain eye contact when giving instructions</td>
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<tr>
<td></td>
<td>- Establish a nonverbal cueing system that will remind student to pay attention</td>
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<tr>
<td></td>
<td>- Use touch or signalling to get student’s attention</td>
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<tr>
<td></td>
<td>- Position the student for optimum hearing</td>
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<tr>
<td></td>
<td>- Be aware of extraneous noise and eliminate where possible</td>
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<td></td>
<td>- Consider the use of study carrels</td>
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</tbody>
</table>
Reasoning

The ability to use past experience from which to draw reasonable conclusions as well as the ability to analyze current information to explore and consider possible actions may be compromised for students with ABI. Students may have difficulty thinking in abstract terms and be able to deal only with cause and effect relationships. Students may also have difficulty understanding the subtleties of language, such as metaphor and the use of humour, particularly sarcasm. All of these difficulties may be exacerbated by stress and overly-stimulating/disorganized settings.

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
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</table>
| Reasoning            | - Provide concrete examples  
|                      | - Check for understanding  
|                      | - Allow the student to DO the task where possible  
|                      | - Teach reasoning overtly through talk aloud, modelling and rehearsal  
|                      | - Be direct  
|                      | - Reduce stress in learning situations  
|                      | - Set up opportunities for learning to be reinforced at home  |
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Problem solving

Difficulties in problem solving can apply in both the academic and social realms. Just as a student will have difficulty considering information within the context of school work to come up with a correct response, so too will they have difficulty reading and interpreting social situations and dilemmas.

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
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<tbody>
<tr>
<td>Problem solving</td>
<td>- Use step-by-step problem solving methods</td>
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<td></td>
<td>- Provide frequent feedback</td>
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<td></td>
<td>- Model problem solving explicitly (talk through)</td>
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<tr>
<td></td>
<td>- Assist students in generating solutions</td>
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<tr>
<td></td>
<td>- Keep instructions clear and explicit</td>
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<td></td>
<td>- Provide opportunities for problem solving at an</td>
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<td></td>
<td>appropriate level</td>
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<td></td>
<td>- Assess student work to find sources of problem-</td>
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<td></td>
<td>solving errors and teach appropriate skills to</td>
</tr>
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<td></td>
<td>compensate</td>
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</table>
In many ways “failure to initiate” can be one of the most frustrating characteristics of a student with ABI. While a student can often verbalize what she/he will or should do, she/he lacks the ability to get started. The lack of action persists and over time, can be identified as a purposeful unwillingness or laziness on the part of the student. It is essential to remember that failure to initiate is a characteristic of the injury and not purposeful behaviour.

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
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</table>
| Initiation           | - Utilize cueing systems (verbal or nonverbal) to get the student started by prompting the student with a first step (e.g., “pick up your pencil and begin writing”) or by gently physically indicating a need to change physical action (e.g., a gentle prod in the shoulder; may need to lead the student to the next location of activity)  
- Incorporate peer support as an assistive cue and to establish the routine or procedure for task achievement  
- Assist student in developing self-monitoring techniques (e.g., schedules, journal of activities to assess task completion)  
- Assist in initiating written work by taking the pencil and asking the student for verbal answers while the teacher or peer acts as a scribe. When the student is involved in the project, give him or her the pencil. |
Students who have experienced an ABI are often left with behavioural/emotional impairments. These impairments can vary in nature and severity relative to the part of the brain that is injured and the amount of damage that has occurred. Students who are left with behavioural/emotional impairments will likely require special strategies to help them compensate for their difficulties. Areas of difficulty may include:

- Frustration
- Disinhibition
- Aggression
- Depression
- Initiation
- Poor self-image
- Poor social behaviour
4.10 - Behavioural/ Emotional Skills and Strategies

Tasks that previously provided little challenge to a student pre-injury may, after sustaining an ABI, prove very difficult. While frustration with mobility and speech may be obvious, a student will also experience frustrations with her/his inability to do such things as acquire new information in a learning environment, maintain pre-existing friendships and in general keep up with the demands of school.

### Frustration

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
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</table>
| Frustration          | - Provide structure in terms of the setting and routine in the programming. The more a child can predict and expect, the less he will be frustrated, even by things which are difficult  
- Monitor new learning based on post-injury information not learning patterns prior to injury  
- Identify antecedents to frustration. What are the specific tasks or things that are difficult or challenging to the student?  
- Allow opportunities for success. Alternate difficult tasks with easier and/or favourite ones.  
- Chunk work into smaller, manageable parts  
- Provide peer support, particularly on tasks that an individual finds difficult and another finds easier  
- Monitor work closely and provide feedback  
- Provide alternatives to acting out (e.g., a quiet place or activity to go to when frustrated)  
- Help the student to recognize the warning signs of frustration (e.g., feeling flushed, rushed, tense, confused)  
- Provide opportunities for open, safe communication (e.g., when the students can voice their frustration and how they can voice their frustrations, what words to use)  
- Know when it is time to take a break and do something different |
Educating Educators

Disinhibition

The ability to control one’s behaviour and make appropriate choices is crucial in a school environment. This is particularly true when attempting to fit in and/or maintain pre-existing relationships. Students who have difficulty with disinhibition may have trouble following rules (social and academic), act impulsively and irresponsibly, as well as display inappropriate behaviour such as being sexually overt.

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<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
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</table>
| Disinhibition         | - Provide opportunities for open, safe communication  
                       - Provide physical cues (e.g., "stop" hand signal) for feedback to student  
                       - Practice cue-on-cue turn-taking, increasing time delay between turns  
                       - Where appropriate, debrief or prepare ahead of time with peers or individual  
                       - Teach techniques for self-monitoring  
                       - Structure situations to allow for positive interaction in a supportive environment where the student can be monitored. As is possible, decrease the number of possible antecedents (number of unsupervised multiple-task demands).  
                       - Make staff aware of student and how to respond appropriately  
                       - Role-model appropriate behaviour (e.g., involve the student in various roles, the giver and receiver of information)  
                       - Teach explicitly social behaviour (e.g., make it clear what is expected, what is acceptable and how to meet these demands)  
                       - Where possible, practice ahead of time for new interactive situations  
                       - Try to contextualize the learning experience (e.g., when possible, practice the behaviour and the learning in the same setting where the behaviour is expected) |
Aggression

Students with aggressive behaviours can pose a difficult challenge for school staff. The use of aggressive language, physical threats and assault are dealt with very seriously in the school system. When a student with ABI exhibits such behaviours, the dilemma of how to respond becomes more complex. It may often be the case that a student with ABI, depending on the injury and the situation at hand, has a great deal of difficulty controlling these types of behaviours. Always the best solution is prevention.

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
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</thead>
</table>
| Aggression           | - Always monitor any potentially aggressive situation with the safety of the student and others as a priority. Look for “signals,” increased volume in exchange of words, picking up objects, etc.  
- Assist student in developing self-monitoring techniques (e.g., moving to a ‘safe place,’ going for a walk/gym when angry)  
- Utilize redirection by directing the child to another task or an errand  
- Debrief when the student is calm and able to listen/attend  
- Be conscious of body language and tone when dealing with an agitated student. “Calm is strength.” Use positive role modelling by maintaining control of your volume, demeanour, tension. The student will adopt your calmness or your escalation.  
- Use proximity control  
- Identify and eliminate/modify triggers (e.g., typically any form of over stimulation, noise, light, colour, number of elements in the environment, tone)  
- Be prepared. Have a plan in place as an educator and staff to deal with instances of aggression. |
Educating Educators

While students may have memory problems, they do not generally forget who they wanted to be before the injury. Dealing with the redefinition of one’s goals, relationships and orientation in a learning and social environment can result in feelings of hopelessness and depression.

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
</tr>
</thead>
</table>
| Depression           | - Work with the students to recognize what they can do, not what they cannot  
                        - Focus on changing emotions, not denying them  
                        - Be observant of symptoms of depression such as withdrawal, change in demeanour, lethargy, lack of interest in appearance, withdrawal from others, verbalizing feelings of hopelessness  
                        - Keep in contact with the family and where appropriate, a professional such as a psychologist, in particular when/if a student expresses thoughts of suicide |
"Failure to initiate" can also be observed behaviourally in a student's failure to act or respond appropriately in social situations. While a student can verbalize what she/he will or should do, she/he lacks the ability to get started and will not reliably be able to follow through with her/his apparent commitment (e.g., to apologize to another student). It is essential to remember that failure to initiate is a characteristic of the injury and not purposeful behaviour.

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
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</table>
| Initiation           | - Structure, consistency and predictable routine  
- Utilize cueing systems (verbal or nonverbal) to get the student started  
- Incorporate peer support as an assistive cue and to establish the routine or procedure for task achievement  
- Set goals with the students recognizing and emphasizing what they would like to be able to do (e.g., use motivation if or when possible)  
- Monitor students closely and provide encouragement and support  
- Assist students in developing self-monitoring techniques (e.g., listen to themselves, watch other people's nonverbal behaviours, listen to how others respond to them)  
- Give the students a choice of doing something (task A) or something else (task B), never something or nothing |
Educating Educators

Students who have sustained an ABI may, in the process of redefining themselves as a learner and a peer, compare and judge their worth based on the abilities they possessed before the injury. This comparison can lead to frustration, depression and poor self-image.

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
</tr>
</thead>
</table>
| Poor self-image      | - Focus on what the student CAN do  
- Never compare current learning or behaviour to student’s ability prior to the injury  
- Where appropriate, discuss situation with student’s peers and allow the peers to assist in plans to enhance self-image  
- Set up a circle of friends, persons that will specifically interact with the student in specific ways (e.g. walk to school, help with homework, buddy in class)  
- Provide achievable and successful academic goals. Do not set the stage for failure on a repetitive basis.  
- Assist the student in recognizing limitations and finding methods to compensate for them |
Poor social behaviour

Students with ABI may often show a lack of sensitivity to the feelings and needs of others. Similarly, they may not read the nonverbal signals of others and may respond inappropriately. Initiating and maintaining friendships can be difficult. Students may lose their ability to feel guilt and empathy. They may behave in impulsive manners that demonstrate poor pragmatics during interchanges with others. By doing so, they may not wait for sufficient information from others and then misperceive the message.

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
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</thead>
</table>
| Poor social behaviour| - Allow the students to work with someone they trust to debrief and prepare them for varying social interactions
- Enlist peer and family support
- Explicitly teach social behaviours such as greeting, showing interest and respecting personal space
- Be direct and specific, but non-judgmental, about what has occurred
- Set social goals with the student and work together to make plans to accomplish them
- Role-model and role-play appropriate social behaviour, providing the student with acceptable alternative ways to achieve her/his goal (e.g., attention, fun, etc.) |
Educating Educators

4.11 - Physical Impairments

Students who have experienced neural injury often experience severe head pain or ache with intensities not unlike a migraine. Any head pain will be disruptive and distracting to any thinking and/or physical endurance required within the classroom.

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
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</table>
| Cluster headaches/ Tension headaches | - Keep a log of pain incidents to provide information to parents and team members for planning of when certain activities should be scheduled and when a “rest” is more appropriate  
- Allow student to leave the room and go to a comfortable place to lay down in darkness  
- Use an intermittent teaching schedule, when possible, to avoid headache onset/exacerbation |

Tinnitus

Students with trauma-based head injury or who are on a certain prolonged use of medications (e.g., aspirin) will experience a disturbing and very irritating and debilitating constant white noise in one or both ear(s). This can be very upsetting, “drive [one] crazy” and competes with any classroom information.

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
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</table>
| Tinnitus (ringing or buzzing in the ear) | - Check that the student is paying attention. The tinnitus can often mask other incoming information.  
- Ask student to repeat instructions  
- Provide preferential seating  
- Utilize other modalities (e.g., provide written, pictorial as well as verbal instruction)  
- Invite the student to repeat a phrase to her/himself until the tinnitus is no longer disabling; white noise, music often can mask the tinnitus experience, especially when it is particularly aggravated |
Resource Binder

**Visual field neglect**

Occasionally, a student will not respond to information on one side of her/his body and/or spatial surrounding. This results in arrested information input.

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
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</table>
| Visual field neglect | - Provide large print  
- Utilize other modalities (e.g., Audition [sound], somatosensation [touch] to bring attention to the neglected side)  
- Provide visual cues to the neglected side (e.g., arrows for direction, colour-coding, dark red line down the left side of the page)  
- Control lighting in the classroom; the more noticeable any aspect of the spatial classroom, the better  
- Provide preferential seating |

**Cognitive fatigue**

Students with ABI may become easily fatigued when faced with lengthy or complex cognitive tasks. Students may complain of being overwhelmed or be unable to focus.

<table>
<thead>
<tr>
<th>Challenge to Student</th>
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</table>
| Cognitive fatigue (brain drain) | - Allow student to rest; some may require 90-120 minutes sleep time (preferably between 1:00-3:00 p.m.); others may need changes within the curriculum, alternating 30-minute rests with 30-minute tasks  
- Chunk (group semantically) work and ideas  
- Consider shortening the day and/or lesson where appropriate  
- Provide frequent breaks  
- Monitor student’s progress and look for plateaus and frustration points in learning  
- Do not overwhelm the student with amount of information, or certain “sameness” of information; allow variety and change |
Educating Educators

Physical fatigue

Students who have sustained an ABI may be less able to sustain an appropriate amount of physical energy to participate fully in an average school day. They may require frequent breaks and a quiet, private place to rest as a result of the ABI.

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
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</table>
| Physical fatigue     | - Provide comfortable place for student to rest  
|                      | - Provide frequent breaks (e.g., pacing, 5-minute breaks)  
|                      | - Monitor student’s attention level  
|                      | - Consider shortening school day where appropriate |

Seizures

For some students an ABI may result in seizure activity. For these students, their ability to cope with these seizures will require that an educator be sensitive and knowledgeable with regard to handling the effects of both the seizure itself and the possible implications of medications used to address those seizures.

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
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</thead>
</table>
| Seizures             | - Monitor and log seizure activity, frequency/severity  
|                      | - Be aware of possible side effects of seizure medication (e.g., “burning” smell, nausea, lethargy); varies between medication type  
|                      | - Educate staff about seizure procedures (especially where there is a muscular component to the seizure)  
|                      | - Obtain permission of parent/pupil before discussing with class |
The ability to care for oneself involves a set of skills that are often affected by the injury. Students with ABI may appear unkempt, unorganized and may have body odour.

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
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</table>
| Self-care            | - Have extra clothing on hand in case of incontinence  
|                      | - Be aware of changes in hygiene                        
|                      | - Provide a place and resources that allow the child an opportunity to “clean up”  
|                      | - Introduce management behaviours (e.g., cued washroom breaks)  
|                      | - Provide assistance for difficult tasks such as buttoning and combing  
|                      | - Monitor response to medication by maintaining a log  
|                      | - Be sure to be well-informed about possible side effects such as fatigue and attention problems |

Students with ABI often have mobility problems. Accessing classrooms, washrooms, cafeteria and upper levels of the school may be problematic. Students with balance problems may require assistance with changes in position and travel to new settings. Students often require more time to travel between tasks/settings.

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
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</thead>
</table>
| Mobility             | - Provide support in seating  
|                      | - Make classroom accessible  
|                      | - Provide adaptive equipment such as a tape recorder  
|                      | - Monitor safety in crowded, unstructured setting  
|                      | - Consult with team to provide supported physical education program during gym class |
The use of fine motor skills is a crucial part of classroom activity. Students with ABI frequently experience impairments in fine motor skills therefore may submit messy or incomplete work, have trouble with completing work on time and experience difficulty engaging in some classroom tasks.

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine Motor</td>
<td>- Allow student to use computer</td>
</tr>
<tr>
<td></td>
<td>- Chunk work into manageable pieces</td>
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<td></td>
<td>- Reduce expectation for written work</td>
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<tr>
<td></td>
<td>- Provide a scribe</td>
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<tr>
<td></td>
<td>- Allow student to report verbally</td>
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<tr>
<td></td>
<td>- Utilize a tape recorder</td>
</tr>
<tr>
<td></td>
<td>- Provide time extensions where needed</td>
</tr>
</tbody>
</table>
4.12 - General Skills and Strategies

Strategies for the School/Classroom Setting

• Be sensitive to partnering students with peers for collaborative work.
• Provide face-saving strategies such as prepping the student ahead of time for reading assignments, unobtrusively modifying work, using nonverbal strategies where possible.
• Keep lines of communication open both with the student and with the family.
• Monitor mood and behaviour changes. Try to discern triggers, stresses and other antecedent events that may be causing those changes.
• Provide opportunity for the student to excel in areas of strength.
• Discuss with the student and the family the possibility of orienting the students in the class to what implications an acquired brain injury might have for their friends and their relationship with their family (to be reviewed on a case-by-case basis).
### Educating Educators

#### Strategies for Specific Subject Areas

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
</tr>
</thead>
</table>
| **Math**             | - Focus on what the student can accomplish, not what she/he can’t  
- Use concrete items to demonstrate mathematical concepts  
- Allow student to use manipulative items to solve math problems  
- Create “real world” functional scenarios for students to practice mathematical concepts (e.g., create and plan a budget, shopping for small items at a local store)  
- Allow student to use a calculator to solve multi-step problems  
- Reduce the workload  
- Practice word problems with pictures or stories that are personally relevant to the student  
- On math sheets with multiple problems, cut out a window from a piece of paper and place over the sheet so that only one problem is visible at a time |

| **Writing**          | - Provide alternative response methods for student such as having another student record verbal answers or take notes  
- Allow for exams to be taken orally so student is not penalized for motor inefficiencies  
- Allow student to use a computer to record responses and complete assignments |
Strategies for Specific Subject Areas

<table>
<thead>
<tr>
<th>Challenge to Student</th>
<th>Strategies</th>
</tr>
</thead>
</table>
| Reading              | - Use a ruler as a line marker to keep place while reading  
|                      | - Go over key vocabulary words prior to reading material  
|                      | - Highlight the key words with a highlighter  
|                      | - Go over a list of key questions with the student before reading then highlight the main concepts of the material  
|                      | - Ask student to summarize larger reading passages into smaller segments  
|                      | - Give student an outline to fill in while she/he is reading |

Strategies for the Playground

- Allow opportunities for practice in social situations.
- Prepare student for transitions from one physical environment to another.
- Provide structured “play” situations.
- Pair student with another student to assist with navigation around the school environment and through activities.
- Adjust expectations to allow for physical disabilities (e.g., fatigue, problems with balance, etc.).
- Keep staff informed and provide extra supervision and support when required.
- Encourage parents to help support and maintain social relationships outside of school settings.
- Allow a safe, low stimulation place for student to go if she/he becomes frustrated, over stimulated, and/or angry.
- Allow for constructive peer feedback.
- Observe student’s social interactions and provide feedback accordingly.
## Strategies for Getting Around the School

<table>
<thead>
<tr>
<th>Problem</th>
<th>Strategy</th>
</tr>
</thead>
</table>
| Locating and identifying a locker| - Allow the student to personalize the locker with a sticker or other identifying markings  
                                    - Locate the locker at the beginning or end of a row for easy identification |
| Remembering the locker combination| - Use a lock that has a key instead of a combination. 
                                    - Have the student write the combination in a day timer or something that she/he always carries  
                                    - Make sure a trusted friend and/or teacher knows the combination |
| Carrying books                   | - Use a knapsack or a backpack on wheels 
                                    - Keep a copy of the textbook in each class and another copy at home so they do not have to be carried at all  
                                    - Keep all the notes for the day in one binder |
| Locating a classroom             | - Use a buddy system 
                                    - Teach the student to use the same route every day  
                                    - Give the student a map of the school that utilizes landmarks for direction (e.g., turn right at the trophy display case) |
| Manoeuvring in the halls         | - Have the student leave class a few minutes early if she/he has problems moving in crowded halls or requires extra time to get to class on time  
                                    - Schedule classes geographically close together |
Chapter 5

Techniques for Working with Individuals with ABI

5.1 Overview
5.2 Redirection
5.3 Restructuring
5.4 The Back Door Approach
5.5 Positive Reinforcement
5.6 Active Ignoring
5.7 Cueing
5.8 Changing the Antecedent
5.1 - Overview

In Chapters 3 and 4, we reviewed many of the cognitive, behavioural and physical complications of persons with ABI and how to address these difficulties as they can present in the classroom. In this chapter, we introduce you to general approaches that can be used in issues, circumstances and with various presentations, whether in the school setting, in the community or in the home. They represent strategies that can be generally applied and adapted to specific situations and represent the general approaches to successfully work with individuals who have experienced an ABI.

5.2 - Redirection

Case Study

Sean hit his head in a car collision a little over 2 years ago. He spent several weeks in a coma and several months undergoing physical therapy, where he relearned how to walk and talk. Despite the severity of his injuries at the time of the collision, Sean is now back at school and judging from his physical appearance seems to have made a full recovery. Recently several of Sean’s educators have noticed some changes in his personality and his ability to interact with other people. When Sean is trying to complete work in a noisy classroom, he becomes frustrated and agitated, often yelling at the students to be quiet. During class discussions, Sean has difficulty accepting and understanding other people’s points of view. On the playground he will become agitated, and at times, will physically threaten other students when he loses or does not get his own way. Despite his apparent remorse after the fact, the incidents are increasing in frequency and severity. When Sean behaves inappropriately, his educators provide him with consequences such as detention and not allowing him to go out at recess. These consequences seem to be counterproductive and only increase his level of agitation.

As a next attempt, Sean has been sent to a counsellor to discuss his discontent, intolerance, and emotional reactivity in terms of the significant trauma he has experienced over the past 2 years - the car collision and having a “near death” experience, being out of school for several months and therefore losing social contact with his peers and friends, and all of the adjustments and difficulties experienced by his family as a whole. While the counsellor had some positive effects, Sean’s behaviour continues to cause him and the school great difficulty.
Resource Binder

Acting upon a suggestion from the psychologist, educators began to attempt to control Sean’s outbursts through redirection, such as inviting Sean to assist in getting out the field equipment for recess and being responsible for its care, rather than continuing with punitive consequences. The results included a significant reduction in the number of outbursts.

What is Redirection?

Redirection is a way of disengaging a person from a particular mode of behaviour (e.g., especially if it is negative or unproductive) and moving her/him to an alternative behaviour (e.g., positive or productive). Its intent is to assist an individual to shift her/his cognitive “mind set”, particularly when she/he cannot do so at all or easily. Persons who experience perseveration, cognitive inflexibility, rigid or concrete thinking or are emotionally active are unlikely or unable to shift her/his mode of thinking. For example, a student is agitated and screaming at his classmates. Rather than reprimanding the student and demanding that he stop, it may be more productive to ask the student to help set up the equipment for the next lesson.
Educating Educators

How is Redirection Used?

The art of redirection involves steering the person away from her/his current behaviour or thought process by engaging her/him in another task or train of thought, especially one that is incompatible with the current behaviour. For example, if a person is presenting with a verbal mode, introduce her/him to a physical task and she/he will be successful at “shifting gears” and vice versa. Redirection is frequently used when direct instruction is ineffective due to the nature of the student’s ABI. In some cases, directly addressing the student to change her/his behaviour may result in making the behaviour worse.

Possible deficits where redirection can assist:

- **Perseveration** - Prolonged repetition of either a verbal phrase or physical movement.
- **Poor judgement** - Engagement in “at-risk” or socially inappropriate behaviours.
- **Lack of emotional control** - Mood changes “on a dime”, becomes easily agitated or upset.
- **Inflexible thinking** - Unwillingness or inability to try a new approach in the face of repeated failure.
- **Inappropriate social behaviour** - Impulsivity, grabs, touches or pokes other students in an inappropriate manner, acts immature for age.
- **Lack of awareness** - Lack of understanding or admission to having deficits, lack of awareness as to how her/his behaviour affects others.
## Examples of How to Use Redirection

<table>
<thead>
<tr>
<th>Behaviour</th>
<th>What Not To Do</th>
<th>What To Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal perseveration on a single thought</td>
<td>Ask the student to stop</td>
<td>Redirect her/him to a physical task (e.g., “Could you please hold this book for me while I get a piece of chalk?”)</td>
</tr>
<tr>
<td>Physical perseveration such as tapping the desk with her/his hand</td>
<td>Ask the student to stop or physically hold hands still</td>
<td>Redirect student to a verbal task such as engaging her/him with questions (e.g., “What did you do at recess today?”)</td>
</tr>
</tbody>
</table>
| Student is over-stimulated and becoming angry during recess | - Tell the student to calm down  
- Provide negative consequences such as detention or a visit to the principal | Redirect the student to a quieter environment (e.g., guide her/him to another location either through role-modelling i.e., walking with her/him and/or inviting her/him to the other room e.g., “Could you go and sort the pencils in the storage room?”) |
| Student is unwilling to listen to someone else’s point of view | Try to explain the alternate viewpoint               | Change the conversation to an unrelated topic (e.g., “Yesterday in science class we learned ...”) |
Educating Educators

5.3 - Restructuring

Case Study

Anna suffered an ABI as the result of being hit by a car while riding her bicycle. She has made many gains since the injury and has learned several strategies for coping with her deficit. Although doctors say she has problems with her memory, Anna is very expressive and never appears lost for words while discussing her recent activities. Recently, Anna has been having some problems with her friends. Many of them have been calling her a liar and say that she makes up stories. During a recent parent-teacher conference, Anna’s mother confirmed that although parts of the stories Anna tells are true, other parts are not, and that Anna makes up these stories at home as well. Knowing that Anna tends to exaggerate, her teacher began confronting her whenever she began to stretch the truth with the hopes of teaching Anna how to stay with the facts when talking to others. Unfortunately, being confronted only makes Anna upset as she feels her versions of her stories are true. No matter how much time and effort her teacher spends with Anna, trying to correct her stories, the exaggerations continue.

Recently, an alternative approach has been tried which reinforces the truthful parts of the story and allows the student the opportunity to build a more realistic version of events. The strategy has been time-consuming but has helped her restore her credibility with her classmates.

What is Restructuring?

Restructuring is a technique used to guide a person to construct another understanding, perspective and/or interpretation of an event/thought/belief that positively and correctly reflects the events of the situation being discussed.
Resource Binder

Possible deficits where restructuring can assist:

- **Confabulation** - Verbalizations about people, place or events that are only partially based on the facts despite the person believing them to be true. Confabulations often result when people with fragmented memories “fill in” missing gaps with details that are not true, but allow for things to make sense and be complete.

- **Rigid Thinking** - When a person cannot consider multiple influences/variables simultaneously; when a person cannot consider alternative perspectives; in each of these cases, the person will interpret events in a linear fashion and may therefore miss the important subtle factors that can lead to certain interpretations.

- **Concrete Thinking** - When a person interprets information literally and cannot interpret metaphors, similes, symbolism or other abstractions.

- **Perseveration** - When an individual cannot readily consider other ideas because they are “stuck” on one view.
Educating Educators

How does Restructuring Work?

- The strategy works by emphasizing, integrating and focusing on the relevant and accurate aspects of comments while ignoring or eliminating the inaccurate information or interpretations of statements into what the person is saying. In doing so, the person is not directly confronted about her/his mistakes, but is guided into telling the correct details of the situation.

- Once the person has generated an inaccuracy, misinterpretation or confabulation, trying to tell her/him that it is not true will only make it more obvious, memorable and cause her/him to defend it more rigorously often leading to agitation.

- Oftentimes the best way to handle misinformation is to focus on what was correct about what the person said and reinforce that aspect, then move the conversation to incorporate other correct and valid information in a subtle but definitive manner (e.g., guide the person to the correct information).
### Example of Using Restructuring

<table>
<thead>
<tr>
<th>Situation</th>
<th>Behaviour</th>
<th>What Not To Do</th>
<th>What To Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>While walking to the chalkboard, Tom tripped on a chair leg and fell. Bob helped him up and he was not hurt.</td>
<td>Rick’s response: “Yesterday Tom was walking up the aisle to sharpen his pencil when he fell and hurt his arm because Bob tripped him.”</td>
<td>Tell Rick that his account of the situation is wrong.</td>
<td>Utilize restructuring to emphasize the truthful parts of Rick’s story (e.g., “That’s too bad that Tom tripped, I’m glad he was not hurt. Bob is a friendly boy and it was very nice of him to help Tom up when he tripped on the chair.”)</td>
</tr>
</tbody>
</table>
Before he suffered an ABI six months ago, Esa, a 15 year old, was very proficient on the computer. Now he has problems learning new applications. When he has problems with new computer applications, he becomes very frustrated, insisting that his failure is the result of a broken computer. As Esa’s frustration increases, the teacher offers to help him with his difficulties. Esa angrily replies “I don’t need help, there is something wrong with the computer, not me and until it gets fixed, I am not going to use it!”

Disagreeing with Esa only added to his frustration. The teacher has found that a more productive approach is to avoid disagreeing with Esa’s perception of a broken computer and then to offer “new” strategies that will help him to succeed.

The back door approach is an expression used to describe interventions that are implemented without the person being aware or confronted and/or interventions that are compatible with, but not identical to, what the person is doing.

Possible deficits where the “back door” approach can assist:

- **Lack of awareness of deficits** - These individuals may not necessarily deny that they were injured, however, they may deny suffering from any long-term effects of a brain injury despite obvious physical and/or cognitive problems. Since they truly believe that they do not have a problem, they do not think they need help and therefore are reluctant to accept any kind of assistance.

- **Unilateral Neglect** - An inability to attend to either the right or left half of their visual field.

- **Agnosia** - The inability to “know” about or recognize certain types of information (e.g., object agnosia - can’t recognize certain objects).
Example of the “Back Door” Approach

<table>
<thead>
<tr>
<th>Behaviour</th>
<th>What Not To Do</th>
<th>What To Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>A student with an ABI is constantly late for class because he cannot cope with the combination lock on his locker. He claims that other students changed locks on him.</td>
<td>Insist that the student practice opening the lock until he can get it right.</td>
<td>Agree that it is really hard to be sure that your lock hasn't been tampered with. Then get the student a foolproof special lock with a key. Keep a spare key handy.</td>
</tr>
</tbody>
</table>
5.5 - Positive Reinforcement

Differential Reinforcement or “Catching a Student Doing it Right”

Since his ABI, 11-year-old James has had frequent outbursts of anger at classmates and the school staff and may throw objects around the classroom. Often the outbursts are directly related to frustration, but sometimes they seem to come out of the blue with no obvious antecedent. Reprimands, isolation and detentions have failed to reduce the frequency of the outbursts.

As an alternative, the teacher and the educational assistant were encouraged to focus on the times when James is interacting calmly and positively with his environment and recognize these as an accomplishment in the hopes of increasing the frequency of the positive behaviours. It is called “catching the student doing something right.”

Case Study

What is Positive Reinforcement?

Positive reinforcement is rewarding “wanted” behaviour, thereby increasing the occurrence of the “wanted” behaviour. Simply put, it is letting someone know that what she/he has done is correct, appropriate and appreciated. It is the best tool to use when trying to increase the occurrence of wanted (desired) behaviours.

Differential reinforcement is using positive reinforcement when the “wanted” behaviour is observed and alternatively, not responding to any “unwanted” behaviours, oftentimes switching rapidly between two modes.

Possible deficits where positive reinforcement can assist:

- Lack of self-esteem
- Unproductive behaviours
- Attention deficits
- Memory deficits
Important Considerations

The secret for making positive reinforcement successful is to not overuse the reinforcer and to genuinely mean it when it is delivered. It is also important to discover what reinforcement works for each particular student.

It is important that the reinforcement becomes internalized to the person. The best kind of reinforcement is anything that the student can generate from others by themselves (e.g., a gesture like a smile or a “thumbs up” signal).

Tangible reinforcers such as tokens may work initially, however, when the student is in a different situation where tokens are not available, the behaviour will not be elicited.

Example of how to use Positive Reinforcement

<table>
<thead>
<tr>
<th>Behaviour</th>
<th>What Not To Do</th>
<th>What To Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>A student is regularly verbally abusive.</td>
<td>Negatively reinforce or punish as many incidents of the unwanted behaviour as possible. Assume that the student will decrease or abandon the unwanted behaviour in order to avoid negative reinforcement.</td>
<td>Use the least intrusive intervention possible to control the verbal abuse. Positively reinforce the student between outbursts for appropriate interactions with classmates and staff.</td>
</tr>
</tbody>
</table>
Six months ago Liam, while a passenger in his uncle’s car, was involved in a head-on collision. Despite the fact that Liam was wearing a seatbelt, the force of the crash resulted in a blow to the head. When he returned to his Grade 10 class school staff noted that, unlike his pre-injury behaviour, Liam often talks out of turn and speaks out before he has been called upon. These behaviours have resulted in Liam becoming more isolated from his peers (e.g., some students are becoming verbally aggressive at Liam’s behaviour, telling him to “shut up” and/or rolling their eyes when he interrupts). Liam’s teacher has asked him to stop several times and has even tried giving him loss-of-privilege type consequences such as staying behind after class. However, these have been unsuccessful and Liam continues to speak out. The in-school team has suggested an “active ignoring” strategy instead. It is felt that a nonverbal, indirect method of responding to Liam’s behaviour, immediately coincident with the occurrence of the behaviour (rather than a delayed consequence) will reduce the negative stigma of being reprimanded in class as well as eliminate any reinforcement caused as a result of gaining the teacher’s attention so frequently. It will permit a procedural, non-judgmental strategy that emphasizes the ineffectiveness of Liam’s current means of participating in class.

**What is Active Ignoring?**

Active ignoring involves the continued monitoring of a person’s behaviour while deliberately not responding or reacting to it. It is performed in such a way so that unwanted behaviours are not reinforced and therefore decrease in frequency.

Possible deficits where active ignoring can assist:

**Impulsivity, poor judgement or inappropriate social behaviour**

When a student acts out, often the first reaction is to ask the student to stop. If this does not work, more and more time, energy and attention is given to the event/behaviour/student in terms of readressing the behaviour or applying negative consequence until the student stops.
Resource Binder

Even though this type of attention is negatively-based and undesirable, the unwanted behaviour is still effective in obtaining attention and/or a response and therefore has the potential to be reinforced.

Sometimes the best way to handle unwanted behaviour is to ignore it, however, in an active and deliberate way.

Active ignoring is different from simply ignoring or not paying attention to the behaviour/student, in that you allow the student to know that the behaviour is detected but that you will not react to it (e.g., make eye contact and [subtly] acknowledge the unwanted action, then look away).

**This strategy must never be used in a potentially dangerous situation.**

Example of How to Use Active Ignoring

<table>
<thead>
<tr>
<th>Behaviour</th>
<th>What Not To Do</th>
<th>What To Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student talks out inappropriately during class.</td>
<td>Verbally reprimand the student in front of the class. Give the student negative/punishing consequences.</td>
<td>Without stopping the lesson, glance at the student so that eye contact is made and then look away, continuing with the lesson. Discuss behaviour with student at an appropriate time.</td>
</tr>
<tr>
<td>Student repeatedly drops pencil on the floor.</td>
<td>Ask the student to stay after class. Ask the student to pick it up after each occasion.</td>
<td>Look at the pencil on the floor, not the student, perhaps even pick it up to demonstrate that the behaviour was indeed noticed; then continue with the lesson.</td>
</tr>
</tbody>
</table>
5.7 – Cueing

Case Study

Mandeep was an excellent student, maintaining a high academic average in her Grade 6 class. Since experiencing a fall during a school soccer game earlier this year she has had difficulty “keeping up” in class. The teacher is becoming increasingly frustrated at Mandeep’s apparent lackadaisical attitude towards work. It is not uncommon for the rest of the class to be busy working on the assigned math exercise and for Mandeep to be sitting with her book unopened. She often seems forgetful and, while knowledgeable about subject areas covered prior to the injury, she seems to have a great deal of difficulty acquiring new information. The educator characterizes Mandeep’s behaviour as having lost her “get up and go.”

What is cueing?

A cue is any type of signal that is used to prompt another person to either engage or disengage in a particular behaviour. There are essentially four types of cues: direct and indirect verbal cues, direct and indirect nonverbal cues (see accompanying chart).
### Resource Binder

<table>
<thead>
<tr>
<th>Type of Cue</th>
<th>Desired Task: Begin homework once the teacher has finished teaching the lesson.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Verbal</strong></td>
<td><strong>Direct Verbal Cue:</strong> The student is reminded verbally, explicitly and specifically as to what to do/what is expected. (e.g. “Joey, please do question #5 of your homework now.”)</td>
</tr>
<tr>
<td></td>
<td><strong>Indirect Verbal Cue:</strong> The verbal cue is given as a non-specific reference that something should be attempted, but the student is required to make the inferences and is not being told by others what to do. (e.g. “Joey, the lesson is over, what can you do next?”)</td>
</tr>
<tr>
<td><strong>Nonverbal</strong></td>
<td><strong>Direct Nonverbal Cue:</strong> A gesture or nonverbal action is used to directly remind the student to complete a task. (e.g. pointing to the student’s workbook and handing her/him a pencil.)</td>
</tr>
<tr>
<td></td>
<td><strong>Indirect Nonverbal Cue:</strong> A look, gesture or other body language that implies what is to be done but does not directly focus on the desired behaviour. (e.g. the student watches other students and/or the teacher begin doing the homework immediately after a lesson.)</td>
</tr>
</tbody>
</table>
The possible behaviours where cueing can assist can be broken down into two categories: (a) cueing used as a reminder; (b) cueing used as redirection.

Cueing can prompt/remind the student to participate in an activity and assist her/him to (successfully) complete a task demand, as in the following situations:

- **Failure to Initiate** - Student does not start tasks especially during unstructured time; she/he may appear “lazy.”
- **Memory Problems** - Student has difficulty remembering the names of teachers and/or students that she/he meets.
- Student has difficulty remembering class material or expectations from day-to-day.
- Student has problems remembering the layout of the school environment, making it difficult to navigate from class to class.
- Student forgets to follow through on plans made the previous day.
- **Attentional Problems** - Student does not stay on task for a reasonable amount of time.
- Student is easily distracted, especially in noisy, over-stimulating environments.
- **Organizational Difficulties/Obstacles** - Student does not follow steps needed to complete a task in the proper order; her/his work appears sloppy, messy, poorly laid out, is often unfinished/incomplete.
- **Problem Solving** - Student has difficulty planning out the steps involved in a task or problem.
Cues can also prompt the student to engage in alternative activities or thoughts that are more appropriate given the setting and/or more productive by introducing a novel idea and/or distraction, as in the following situations:

- **Perseveration** - A student appears to be stuck on a single verbal thought or action, which they repeat and cannot move on from, often described as a “broken record”, or doing something she/he cannot “get over”.

- **Agitation** - Student demonstrates low tolerance for frustration and becomes agitated and emotional, even angry or inappropriate for the context.

- **Over-Stimulation** - When in crowded, noisy, visually stimulating, or highly demanding environments the student becomes more engaged by the stimulation (e.g., inattention to the task at hand and attentive to the source of stimulation) and may also appear confused, agitated, unproductive and even verbally or physically abusive.

- **Rigid/Inflexible Thinking** - Student forms a particular (often linear) opinion about something and is unwilling or unable to discuss or understand any other contradicting opinion.
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How to use cueing

Initially, cues can be used to clearly, specifically, and explicitly tell a student to do a particular task - direct verbal cues. Over time they can become less directive in nature and eventually become synonymous with environmental cues (e.g., time of day, current context) - indirect nonverbal cues. This is accomplished by starting with the most direct kind of cue and progressing through the different types of cues until the student can generate the desired behaviour using the least directive cue. Using the least directive type of cue ensures the opportunity for learning, self-control and empowerment.

Implementation of Cueing Strategies

<table>
<thead>
<tr>
<th>Behaviour</th>
<th>What Not To Do</th>
<th>What To Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student consistently fails to begin work when requested.</td>
<td>Assume the student is lazy or noncompliant and provide negative consequences as a means to promote initiation.</td>
<td>Identify what specifically the student has problems initiating (e.g., finding page in text, gathering materials). Depending on the assignment, use verbal prompts (and/or a list), visual reminders, or proximity to assist the student to begin work.</td>
</tr>
<tr>
<td>Student seems to learn concepts but is consistently unable to retrieve information at a later time.</td>
<td>Assume the student is not able to learn new information. Assume that the student is not trying hard enough. Continually increase the workload in order to have the student “catch up”.</td>
<td>Provide the student with an outline. Describe events, activities, or associations that reinstate the original learning context (e.g., “Yesterday, after recess, we were working on our drawings for the concert...”).</td>
</tr>
</tbody>
</table>
Meaghan and Daley did everything together. Being twins allowed the girls opportunity to doubly enjoy the events of their lives.

Preschool was their first great adventure outside the nurturing environment of their home. It was at the preschool playground that Daley took a tumble off the climbing equipment. Returning to school, after a brief absence, Daley began to exhibit behaviour that alarmed her teacher. Her teacher began to notice that whenever Daley was asked to complete a task such as tidying up after art time, her response was extreme or she was often unresponsive. Initially, her teacher attempted to address this misbehaviour through providing consequences such as withdrawing free time. The use of such consequences resulted in a dramatic increase in Daley’s misbehaviour. Following discussions with Daley’s parents and colleagues at her school, Daley’s teacher decided to try a very different approach. Instead of applying a consequence after the behaviour had occurred, care was taken to anticipate a behavioural response and prepare in advance for the outcome to be positive. For example, at art time, Daley’s materials were kept simple and laid out in an organized way. Prompts and warnings were given, prior to clean-up and plenty of time was given for the transition. The approach tried by Daley’s teacher resulted in a much calmer and productive day for both student and teacher.

When working with students with ABI who display unwanted behaviours, it is possible that the behaviours are simply a result of the student being oppositional.

However, it is more likely that the unwanted behaviours are the result of some kind of organically based cognitive deficit. These students do not enjoy engaging in unwanted behaviours, however, because of their injury they can become overwhelmed, confused and/or over stimulated. Without the proper coping strategies, acting out becomes their only way of communicating their needs and/or reacting to their discomfort.
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Therefore, these unwanted behaviours need to be seen as a means of communication and when devising behavioural strategies for a student with ABI, it is important that the focus always be on what is driving the behaviour.

Traditionally, the following model has been used to devise behavioural strategies:

Something happens to elicit a behaviour (antecedent), the student reacts to the antecedent (behaviour) and a consequence is then given in an attempt to either encourage or divert the student from engaging in the (wanted or unwanted) behaviour again.

In this model, the focus is put on providing a consequence for the behaviour with the idea that the student will learn to associate: 1) unwanted behaviour with an unpleasant consequence and therefore not engage in the behaviour again or 2) wanted behaviour with a favourable outcome.

The problem with this type of “Consequence-Focused” approach with a student who has an ABI is that the student may no longer have the ability to learn from consequences for one or more of the following reasons:
1. **Damage to the ventral medial prefrontal cortex** - Damage to this area results in the inability to connect feelings associated with rewards and punishments to stored memories of the learning events.

2. **Inhibition Impairment** - An impulsive student is likely to act before thinking about past episodes that resulted in negative or positive consequences.

3. **Impaired Working Memory** - Students with poor working memory may be unable to recognize or have the capacity to simultaneously process the similarities between the current context, past episodes and current intentions.

4. **Impaired Initiation** - A student with an organically based initiation problem may not engage in a behaviour dictated by past learning experience because of an inability to activate any effective behaviours.

Therefore, instead of using a consequence-focused approach, using an “Antecedent-Based Approach” is often much more effective with a student who has an ABI.

By identifying the antecedent and modifying the environment/situation accordingly, you decrease the chance that the person will engage in the behaviour.
Identify the Antecedent:
• Often people are quick to say that a person just acts out for no reason, however, there is always an antecedent; some are just easier to identify than others.

Antecedents could include:
• **Environmental Factors** - over stimulation, sensitivity to light, noise, colour, weather, etc.
• **Internal Factors** - hunger, thirst, pain, fatigue, past experiences, medication side effects, sensorial limitations (e.g., vision), etc.
• **Cognitive Factors** - misinterpretation of the literal message, context, nonverbal signal, etc.

Change the Antecedent:
• Always change and preferably eliminate the “triggers” of unwanted behaviours and introduce/promote those of wanted behaviours.
• Remember that it is always easier and often more desirable, to change the environment than it is to change the person.
• *When you can’t change the settings, then anticipate the outcome as a means to minimize the negative response and maximize the positive one.*
This strategy modifies behaviour by providing the student with the assists that can aid the student.

### E.g., Task to be accomplished - Jimmy must sit down to look at his daily schedule and then complete a writing assignment.

<table>
<thead>
<tr>
<th>Student’s Behaviour</th>
<th>Teacher’s Response</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>When asked to sit down, Jimmy walks to the other side of the classroom.</td>
<td>“Good idea, Jimmy, we will need a pencil. While you are over there can you please grab one so we can get this work done?”</td>
<td>Instead of consequencing Jimmy, which could very well lead to him becoming even more oppositional, the teacher turns his negative behaviour (walking to the other side of the classroom) into a positive behaviour (since you are over there, grab a pencil).</td>
</tr>
<tr>
<td>Jimmy takes the schedule and places it in his book bag under his desk.</td>
<td>&quot;Putting your schedule away someplace safe is a good idea Jimmy, that way you will know where it is the next time you need it. Now let’s get to work.&quot;</td>
<td>Instead of addressing the defiant behaviour (not leaving the schedule on the desk) and providing consequences to try and modify it, the teacher turns it into something positive (by putting it away you will know where it find it for next time).</td>
</tr>
<tr>
<td>Jimmy does not get a pencil, but does come over and sit down.</td>
<td>Looking at the daily schedule, the teacher says, “Wow, Jimmy by the look of this, you have been busy today. I’m going to put this right in front of us so we can see all that you have accomplished. Let’s get your writing assignment done.”</td>
<td></td>
</tr>
<tr>
<td>Jimmy picks up his pencil and begins to work.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Educating Educators
Chapter 6
Individual Program Planning/Returning to School

* Information related to the development of the Individual Education Plan (IEP) is based on the template provided by the Ministry of Education for the province of Ontario (Canada). While the templates, terminology and regulations regarding the development and administration of IEP's certainly vary from setting to setting, the component parts remain generally consistent.
Once again the teacher turned her head to hear the sound of singing. Casting a quick glance at the art table, Ms. Campbell allowed a fleeting grin to cross her face. Shifting her expression quickly, to escape the notice of the second graders, she masked her amusement with a sterner look of “let’s get to work.”

“Joan, could you please work more quietly so as not to disturb the other students,” Ms. Campbell said kindly. With her usual smile, Joan nodded her head and continued with her painting.

After Joan’s accident, Ms. Campbell would remember this moment over and over again. Joan would always sing, chatter with her friends, and meet her tasks with enthusiasm. Always a popular child, Joan was one of those children who brought sunshine to those around her, making what could sometimes be a dreary day brighter.

It was on one of those dreary days, with rain pouring down in sheets, that Joan had slipped on some wet pavement and bumped her head. At first, Joan’s parents and teachers were not concerned. For the first few days she had seemed a little more sleepy than usual and allowances were made by allowing her to sleep late at home and come in after morning recess.

What was hoped to be a temporary condition persisted. Joan’s teacher noticed that even beginning her day at 10:15, Joan seemed tired and grumpy. After a month, with report cards looming, Joan’s teacher confirmed what she had suspected—there had been a sharp decline in Joan’s work.

Concerned, Ms. Campbell referred Joan to the in-school team. Over the remainder of the year, Joan underwent a number of assessments including teacher observation and more standardized types of measures. What resulted was a consensus by those involved that Joan’s program would have to be individualized to meet her particular needs.
### 6.2 - Myths and Misconceptions

<table>
<thead>
<tr>
<th>Myth:</th>
<th>Acquired brain injuries are obvious when they occur and always well documented.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fact:</td>
<td>Some parents, as well as professionals will be unaware that a brain injury has occurred.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Myth:</th>
<th>All acquired brain injuries result in an absence from school.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fact:</td>
<td>Brain injuries can occur from minor falls or other accidents that do not result in a loss of consciousness or even a trip to the emergency room, so the student may not miss any school.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Myth:</th>
<th>All brain injuries are the same and all students with brain injuries will behave and learn the same way.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fact:</td>
<td>Brain injuries are not all the same; their nature and severity vary extensively. A student’s behaviour and learning as a result of a brain injury are unique.</td>
</tr>
</tbody>
</table>
Students who have sustained an ABI will require additional support upon returning to school. Depending on a variety of factors such as the severity of the injury and the length of absence from school, the preparation and response on the part of educators can facilitate a smooth and successful transition back into a school environment.

Prior to reintegration

1. Compile information about the student
   • Samples of work
   • Review school records
   • Discussions with parent, medical staff, previous teachers
2. Establish a plan for the exchange of information
   • Identify potential trouble spots
   • Academic
   • Social
   • Physical
3. Learn about the nature of the student’s injury and the implications for learning and socialization
4. Access necessary resources (materials and personnel)
5. Make arrangements for anticipated assessments
6. Assess suitable placement options (consider classroom layout and location, educator and peers)
7. Develop an IEP. (For detailed information on IEP, see Section 6.4)

(Adapted from Roberta DePompei, Youth with TBI: Cognitive and behavioral issues for reintegration to school and community)
<table>
<thead>
<tr>
<th>Implication for school setting</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>School's awareness of injury and whether or not the school would be notified</td>
<td>ABI may not even be identified and school may not receive notice of an injury</td>
<td>School would most likely be notified and aware of the injury</td>
<td>School would be notified and aware of injury</td>
</tr>
<tr>
<td>Absence from school</td>
<td>Not a significant absence from school, if there is an absence at all</td>
<td>A couple to a few weeks, student should theoretically be able to catch up on missed work</td>
<td>A couple to a few months or more, making the amount of work missed difficult to get caught up on</td>
</tr>
<tr>
<td>Communication between hospital and school</td>
<td>Little to no communication would likely occur</td>
<td>May be some liaison with the hospital while the child is recovering, generally handled through the parent(s)</td>
<td>Liaison with the hospital during the child's recovery and after discharge generally through case managers and special ed. staff</td>
</tr>
<tr>
<td>Information and training for school staff in ABI</td>
<td>Needs to focus on intervention techniques for cognitive issues (memory, initiation, judgement, motivation, etc.)</td>
<td>Focus needs to be on cognitive issues as well as how to aid the student in socialization and integration issues. May include information on how to overcome physical barriers in the environment</td>
<td>Teachers will need information on cognitive issues pertaining to varying modalities for learning along with the physical and socialization needs of the student</td>
</tr>
<tr>
<td>Assessment considerations</td>
<td>If ABI is undiagnosed, changes in academic work may be subtle and unnoticed by teachers</td>
<td>May be based on performance and would consist of a more formal assessment performed by a psychologist</td>
<td>A full neuropsychological assessment may be performed, assessment of student's physical needs within the school may be necessary</td>
</tr>
<tr>
<td>Goals and IEP</td>
<td>Should focus on staying as close to the curriculum as possible with additional support and monitoring</td>
<td>As much as possible, curriculum should be followed, allowing modifications to time schedule, and additional support from external sources (e.g., physical therapist, speech and language therapist, etc.)</td>
<td>Program should be modified so that the focus is on the child's strengths and capabilities. Major shift in curriculum. Academic, social, physical and cognitive goals will need to be generated</td>
</tr>
</tbody>
</table>
6.4 - What is an Individual Educational Plan (IEP) and Why is it Important?

The Ministry of Education for the province of Ontario defines an Individual Education Plan as a:

“written plan describing special education program and/or services required by a particular student” (pg.3)

*(Individual Education Plans Ministry Document 2000)*

An IEP is:

- A summary of the student’s strengths, interests and needs and of expectations for a student’s learning during a school year that differ from the expectations defined in the appropriate grade level of the Ontario curriculum.
- A written plan of action prepared for a student who requires modifications of the regular school program or accommodations;
- A tool to help educators monitor and communicate the student’s growth;
- A plan developed, implemented, and monitored by school staff;
- A flexible working document that can be adjusted as necessary;
- An accountability tool for the student, his or her parents, and everyone who has responsibilities under the plan for helping the student meet his or her goals and expectations;
- An ongoing record that ensures continuity of programming; and
- A document to be used in conjunction with the provincial report card.

*Individual Education Plan (IEP) resource guide 1998
Government of Ontario*
Resource Binder

An IEP is a working document available to educators, educational assistants and other resource personnel within a school who share a common goal and work together to provide students with the environment and opportunity to succeed. While an IEP does not define in minute detail every aspect of a student’s day, it is a flexible document that reflects the changing needs of the student through continuous review.

The Ministry of Education (MET) for the province of Ontario states that the following information should be included in the IEP:

- Student's strengths and needs
- Relevant medical/health information
- Student's current level of educational achievement in each program area
- Goals and specific expectations for the student
- Program modifications (changes to the grade level expectations)
- Accommodations required (supports that will help students access the curriculum and demonstrate learning)
- Special education and related services provided to the student
- Assessment strategies for reviewing the student's achievements and progress
- Regular updates, showing dates, results and recommendations
- Transition plan (if required)
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How is an IEP for a student with ABI different?

Each IEP by its very nature will be different. In the case of ABI there are a number of factors that need to be considered in the development of an effective IEP. The team developing the IEP needs to be aware of the following:

- **Academic history** - Prior learning and academic knowledge, while most likely intact, will not be indicative of new learning or the student’s ability to acquire new knowledge.

- **New assessment information** - In the case of ABI in particular, standardized and informal testing may be misleading. These types of testing tap previous knowledge and may fail to access the student’s ability in dynamic, authentic situations where learning may be severely compromised. Students with ABI may perform well on tests that tap into one skill area but be unable to demonstrate that skill in a classroom setting with additional demands and distractions, etc.

- **Other medical concerns** - Depending on the severity of the injury, loss of school time, pain management, medication effects, fatigue and mobility issues may need to be considered in terms of programming.

- **Physical recovery versus cognitive recovery** - Immediate physical concerns and considerations, which will have been the focus of recovery, may mask the more subtle cognitive concerns. A student who recovers from the physical impact of ABI (e.g., A broken leg has healed) may continue to have cognitive difficulties, which need to be addressed though an IEP.
Resource Binder

- **The need for frequent review** - Given the variability of ABI and taking into account the recovery period, which can last for up to two years, more frequent reviews of a student’s IEP may be required.

- **Need to access community agencies** - The team that develops an IEP for a student with ABI may include professionals such as neuropsychologists that are not normally part of this process. Accessing and utilizing these professionals is essential in the development of an effective plan.

- **Family, peer, and student adjustment** - Following an ABI there will need to be frequent communication and support provided to all persons involved. ABI can result in a sudden redefinition of a student’s place in her/his family structure, peer group and her/his identity as a student.
6.5 - How is an IEP Written?

The following set of steps, as outlined by the Ministry of Education and Training, describes the process of developing an IEP.

A variety of sources are to be used in the gathering of information for the development of an individual education plan. Those sources of data include but are not limited to:

**Gathering information:**

- A review of the student’s School Records which might include information such as previous report cards and reports by teachers and other professional staff, medical information, previous IEP’s and school history.

- Information from people who have different insights and perspectives on the student such as the classroom educator, parents, principals, special education teachers, previous educators, other professionals and the student (where appropriate).

- Assessment information gathered from a variety of sources and using a variety of techniques including observation, anecdotal records, checklists, interviews of students and others, samples of the student’s work portfolios, test papers, journal entries, assignments and artwork, direct individual observation, diagnostic tests, standardized tests and additional consultation.
The special case of ABI – information gathering:

- Records of pre-injury data from previous educator can be helpful.
- Standardized Assessment information may be invalid due to the lack of an ABI normative group.
- Measures of performance may lead to false optimism about future learning.
- Sample collaboration with other professionals.
- Need for observation across a variety of contexts. Standardized tests may not be appropriate.
- Physical injuries may mask cognitive difficulties.
- Needs may change as recovery progresses.
- Some cognitive difficulties may not be apparent until the student reaches another stage of cognitive development that requires them to utilize the part of the brain that was injured.

Setting the direction:

Ministry of Education guidelines state clearly that the in-school team is the recommended vehicle for the development of an IEP.

“The IEP should be developed collaboratively by those who know the student best and those who will be working directly with the student”


While the membership of the in-school team may vary depending on the needs of the student generally, educators, administrators, health professionals, paraprofessionals in the school, parents and where appropriate, the student her/himself, may all play a role on the team. Collaboration that takes place in the development of the IEP by the school and/or board staff must be recorded. While the responsibility for the development and dissemination of the plan rests clearly with the principal, the principal may delegate this responsibility to the vice-principal in elementary schools and the vice-principal or other staff member in secondary schools. It is important that the team have members who:
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- Have knowledge of the student and wherever possible, have experience teaching the student
- Have knowledge of the Curriculum
- Are qualified to provide or supervise the provision of special education programs and services to meet the needs of the exceptional student
- Have knowledge of the special education strategies and resources available in the district school board

The special case of ABI – setting the direction

- A case manager may need to be assigned to coordinate between professionals.
- Many members of the team may have a very limited or even nonexistent knowledge base with regard to ABI.
- Lack of specific services and programming may severely limit the possible directions that may be pursued.
- Because of the necessary involvement of outside agencies (e.g. hospital staff) terminology, procedures and assumptions will need to be explicit to allow for effective communication.
- Parents, the student her/himself, and even staff will experience a period of adjustment in reconceptualizing this student in their school environment.
The development of an IEP begins with the listing of the student’s strengths and needs. It is important that, where appropriate, the IEP clearly indicates “learning expectations” as taken from the Curriculum. These expectations are based on the student’s strengths, needs and current level of achievement and identify the knowledge and skills that the student is expected to acquire.

**Establishing goals and expectations:** Goals and expectations based directly on the strengths and needs of the student are established by the team.

The aim of these goals is to:

- Provide the student with a focus and motivation for his or her learning;
- Help educators develop learning activities that are specific to the strengths, interests and needs of the student;
- Enhance accountability by providing everyone with a point of reference against which to measure achievement;
- Facilitate team-parent/student communication;
- Facilitate communication.

_Determine strategies and resources:_ Based on the information gathered thus far, it is now the responsibility of the team to discuss and decide upon strategies and resources. These strategies and resources must be put in place with the intention of assisting the student to reach the goals and expectations laid out in the IEP. Strategies and resources may include human and material resources, as well as specific accommodations/modifications such as simplifying the language of instruction and allowing extra time to complete assignments.
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Develop a transition plan: These plans are generally written for students 14 years of age and older and include information on the student’s transition to appropriate postsecondary activities, such as work, further education and community living.

Transition plans can also be developed in those cases where a child is moving from school to school, school board to school board, or in or out of a school environment to a community environment.

Where appropriate, community agencies should be included in the development of the transition plan.

Establishing a monitoring cycle: In order for an IEP to be successfully implemented, it is essential that the implementation of that plan be carefully monitored. It is recommended that criteria be developed for evaluating the programming that has been developed for the student, that assessment and monitoring occur on a regular basis and that the IEP be adjusted accordingly.

The special case of ABI – developing the IEP:

- Setting annual goals may be complicated by recovery period or lack of professional expertise.
- Transition planning may need to be considered from rehabilitation setting to school setting.
- Goal setting will be complicated by differing abilities across curricular areas and settings.
- Very important to differentiate behaviour from cognition. Do not set goals that are impossible to accomplish given the nature of the injury (e.g., Failure to initiate).
Implementing the IEP:

Members of the school team, parents, and where appropriate, the student as well as other personnel involved need to be informed of the details of the IEP and communicate regularly about possible revisions.

It is recommended that the team:

- Review the IEP with the principal;
- Meet with appropriate staff to discuss implementing the activities described in the IEP, the responsibilities associated with the plan, and monitoring the plan;
- Meet with the parents and the student to explain and discuss the contents of the IEP and the monitoring plan, and to discuss parental involvement in support of the plan.

Once the plan has been shared, members of the team translate the IEP into daily learning plans that can be carried out in the educational setting. With the plan in place, it then becomes essential that those involved in its delivery monitor and adjust the plan accordingly.

The special case of ABI – implementing the IEP:

- Student may be misplaced due to lack of a category for ABI.
- Missed time may cause disruption to implementation.
- Behaviour/learning may be difficult to assess across contexts because of the inability of the student to transfer and generalize skills.
- What may be an effective strategy for one setting, may need to be changed for a different setting.
Educating Educators

As noted, the IEP is a working document that is meant to reflect the changing needs of students across educational settings. It is important that an IEP is reviewed on a continual basis. At the time of review, changes and adjustments can be made based on the information provided as to the success or failure of the planned interventions. It is recommended that an IEP be updated at least once each reporting period.

The special case of ABI – reviewing and updating:

- Initially, reviews may need to be more frequent and responsive depending on the rate of recovery of the student (e.g., physical injury such as broken bones).
- Reviews may need to be more frequent for students with ABI than for other students, as recovery can extend over many years and can happen in unpredictable spurts of progress.
Throughout a student’s educational career a number of transitions take place. For those students who follow the normal course of education these transitions occur with the entry to school at the preschool level, the transition from elementary school to high school and finally, the transition from high school to post-secondary or working lives. In the case of a student who has sustained a brain injury prior to or during her/his educational life, an additional transition may be added: that of transition from pre- to post-injury.

Transition from pre- to post-injury may manifest itself in varying ways. In some situations a student who has sustained a brain injury may have been temporarily absent from school and under the care of a physician. In other situations a student may have received a blow to the head that did not result in medical intervention and has returned to school without any absence.

Whether the injury is mild, moderate or severe, transitions for students with ABI can be very difficult. It is important to remember that once a transition has taken place, for example from hospital to school, that the effects of the transition and the adapting to the new setting must be monitored.

Prior to reintegration, communication must be established between the school and the medical personnel involved in the case. This is often best done through communication with the parents. It is recommended that personnel in the school setting assign the task of coordinating this information between participating parties to one individual. This individual is often the special education teacher.

Within the school setting, educators can prepare for a student’s transition back to the classroom by compiling information about the student’s performance in school prior to the injury.
Educating Educators

This could include information contained in the student’s records such as report cards, testing results and in the case of a student with a previously existing identifiable condition of exceptionality, an Individual Education Plan. Information about a student’s pre-injury school performance should also be accessed through samples of previously completed work and discussions with previous and current teachers.

It is also essential that the school, through their in-school team, develop an Individual Education Plan to address the transitional and ongoing needs of the student returning to school (see IEP).

Some considerations for students with ABI

As described earlier, all students experience transitions throughout their school career. For each student, certain adjustments will be made in order to adapt to that new environment. For students with ABI, additional care will need to be taken to help ensure a successful transition to a new environment.

<table>
<thead>
<tr>
<th>Transition from preschool or home to primary school:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Collect information from sources: medical, family.</td>
</tr>
<tr>
<td>- Screen (preschool) to establish skill level.</td>
</tr>
<tr>
<td>- Develop IEP where appropriate.</td>
</tr>
<tr>
<td>- Set up communication system with home.</td>
</tr>
<tr>
<td>- Orient student to new environment ahead of time.</td>
</tr>
<tr>
<td>- Gradually introduce student to setting (shortened day) where appropriate.</td>
</tr>
</tbody>
</table>
### Resource Binder

#### Transition from elementary school to high school:
- Update assessments where necessary.
- Meet with staff at high school ahead of time.
- Orient student to new setting.
- Consider reduction of course load.
- Look at a mobility plan for the student getting from class to class.
- Develop IEP.
- Try to ensure that student is placed with some of her/his friends.

#### Transition from high school to postsecondary or working life:
- Begin early in high school career, where appropriate, making community connections.
- Develop a transition plan.
- Provide supported work experiences.
- Work closely with family.
Educating Educators

While many jurisdictions recognize ABI as a category of disability within educational settings, there remain areas where the debate whether to include ABI as a recognized disability continues.

This lack of an official category can result in students with ABI being mislabelled as learning disabled (LD), developmentally delayed or behavioural. Mislabelling will lead to programming that, on the surface may seem likely to address the students’ most pressing requirements, but very likely will fail to meet their complex needs. In some cases students with an ABI are thought to have learning disabilities. While many of the strategies that are effective with LD are also effective with students who have an ABI, the mislabelling fails to recognize the specific needs of the student with an ABI and the evolving nature of her/his impairments.

Students with ABI, unlike those with learning disabilities, may:

• have a pre-injury history of successful school experience,
• have the ability to remember and utilize information learned prior to the injury but have difficulty attaining new knowledge,
• learn well in isolation but lack success when skills are integrated,
• be difficult to assess since standardized and informal measures of assessment provide information on previous learning, not on how students learn,
• experience pain and fatigue issues related to physical recovery, have a constantly changing profile as the result of cognitive development and recovery period,
• experience social difficulties reintegrating to a peer group or even family that has expectations that the child will be unchanged,
• have difficulties with anger management and levels of frustration that did not exist pre-injury,
• lack awareness of the effect of their injury and the degree of impairment.

Similar difficulties arise with the mislabelling of these students as developmentally delayed or behavioural. The label of developmental delay can result in a failure to recognize the intact knowledge and uncompromised areas of cognition and thus fail to tailor a program to tap into these vital intact abilities. For example, a student with severe short-term memory impairment may be able to comprehend quite well but is unable to retain what has been learned. The danger is that there may be an assumption that lack of memory reflects lack of comprehension and the student is moved to a lower level of programming. It may be the case that with different techniques such as concretizing the experience, repeated exposure and discussion to contextualize the learning, that the student can work at the appropriate cognitive level for his or her ability. In the case where a child is mislabelled behavioural, misinterpretation of physiological symptoms such as failure to initiate and social inappropriateness as manifestations of wilful misbehaviour can lead to the misuse of behaviour modification in an attempt to “cure” that which is a manifestation of the ABI.

It is important to note that this lack of an official category does not necessarily prohibit a student with an acquired brain injury from accessing funding or services. While it is possible for children with ABI to receive services without a category, many schools, school boards and families are left scrambling to describe and define a set of behavioural and learning difficulties that, while similar to more recognized educational exceptionalities, are decidedly different.
Educating Educators
Chapter 7

A Team Approach to Assessment and Planning

7.1 Myths and Misconceptions
7.2 Working with Other Professionals
7.3 Personnel Available at School and School Board Level
7.4 Other Related Professionals
7.5 Things to Remember When Accessing Help
7.6 A Team Approach to Assessment and Planning
**Myth:** Most professionals given their training will be effective collaborators.

**Fact:** While being consultative/collaborative may be a strength for some, utilizing these skills in a school team setting may often require a certain amount of training and or practice. Coming to a consensus, dealing with resistance and maintaining focus in a group setting can be complex skills and often require that individuals explore and practice effective consultation techniques.

**Myth:** If team members are agreeing with you then the meeting is successful.

**Fact:** While it may be true that agreement is just what it seems, it is also just as likely that agreement can be a form of resistance. Agreeing with a suggestion or a statement without further discussion can be an indication that the person agreeing is in fact trying to end the meeting. Resistance comes in many forms, such as humour, silence, confrontation, as well as consensus. Recognizing and dealing with resistance is a crucial skill in successful consultation/collaboration.

**Myth:** The medical community will be able to provide information on how to implement a program.

**Fact:** The medical community may be able to assist with a description of the impairments experienced by a student with an ABI. In some rehabilitation centres, specially trained resource teachers will be available to assist, but for the most part, it will be left to educators and the school team to discover the strategies that will be needed to cope with those impairments.
| Myth: | Serious physical impairments are always noted in the Ontario Student Record. |
| Fact: | While most serious physical impairments are noted on the Health Record found in the Student Record, ABI is often the exception, either because it is never medically diagnosed or because the impairments connected with an ABI are not immediately apparent. |

| Myth: | Special education personnel at the system level are generally well-informed about brain injury. |
| Fact: | Until very recently, there has been almost no mention of ABI in faculties of education preservices programs. ABI is still not recognized as a distinct disability in Ontario by the Ministry of Education. |
Educating Educators

7.2 - Working With Other Professionals

The Team Approach

It is essential that information be shared along with responsibility and accountability to ensure that the team works as it is intended, with all members having an opportunity to participate.

The team approach in special education is by far the most common and effective way of dealing with the diverse needs of students with exceptionalities. In the case of students with acquired brain injury, the members of the team may include a number of personnel not normally utilized in a school setting. In those cases where a student has required intervention at the hospital and rehabilitation level, those professionals generally associated with a medical model of service delivery will be involved in developing a plan for the student.

Within the Ministry of Education guidelines for the development of an individual educational plan, the utilization of a team approach in addressing the concerns of a student with an exceptionality is clearly delineated. It is essential that professionals, parents, and where appropriate, the students themselves be given an opportunity to share information and work together in formulating a plan. It is not always possible or perhaps even preferable to have all those involved in the same room for each team meeting. Involvement in a team meeting may, for some, take the form of a written report submitted ahead of time or information passed on at another time. Because of this, it is important that one person take on the role of coordinating the report and informing all parties of pertinent information. This role is generally, at the school level, performed by a special education teacher and overseen by the principal.

As is often the case, members of any team come to the table with a variety of views, differing amounts of information and perhaps, differing opinions on what the end goal of the meeting might be. While it is very common that all members share the goal of improving the school life of a student, how to reach this goal may be a basis for some lively discussion. Health professionals may focus on the physical rehabilitation aspects of treatment, educators may
be more concerned with curricular concerns and parents or the students themselves may be more concerned with effect in terms of re-establishing friendships and feeling comfortable in school.

For team meetings to be successful, a relationship of trust must be established that allows all the participants to voice their concerns and suggestions for programming. It is essential that team members decide on goals that are mutually acceptable to each other, communicate those goals and share responsibility in attaining them.

Perhaps the most important element of a successful team is the commitment of the school administrator to ensure that the team process proceeds smoothly. Professionals agree that for an in-school team to be successful, the following considerations must be addressed.

In-school teams must:

• Meet regularly
• Have and follow an agenda
• Have a meeting place that is not open to constant interruption (such as the staff room)
• Have regular members, which includes an administrator
• Review documentation and information prior to the meeting
• Keep appropriate documentation
• Focus on problem solving
• Recognize the personal and professional assets of team members.
### 7.3 - Personnel Available at School and School Board Level

<table>
<thead>
<tr>
<th>Profession</th>
<th>Role</th>
<th>How to Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning resource teacher</td>
<td>- Individualized support for students</td>
<td>- Available in most schools</td>
</tr>
<tr>
<td></td>
<td>- Liaison between team members</td>
<td>- Can see students informally</td>
</tr>
<tr>
<td></td>
<td>- Resource support for classroom teachers</td>
<td>- Is required to oversee any identified students with exceptionalities</td>
</tr>
<tr>
<td>Psychologist</td>
<td>- Cognitive assessment</td>
<td>- Generally referred through learning resource teacher and central office staff</td>
</tr>
<tr>
<td></td>
<td>- Behavioural assessment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Recommendations for programming</td>
<td></td>
</tr>
<tr>
<td>Educational assistants</td>
<td>- Implementation of program in coordination with educator</td>
<td>- Additional funding through special education budget</td>
</tr>
<tr>
<td></td>
<td>- Individualized support for student</td>
<td>- Can be tied directly to IEP claim</td>
</tr>
<tr>
<td>Counsellors</td>
<td>- Varies from school to school and school board to school board</td>
<td>- Referral through school or can be accessed through parent referral</td>
</tr>
<tr>
<td></td>
<td>- Generally responsible for providing individual counselling to students</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Career counselling to older students</td>
<td></td>
</tr>
<tr>
<td>Speech and language pathologists</td>
<td>- Language and speech assessment and programming</td>
<td>- Referral from school or physician</td>
</tr>
<tr>
<td></td>
<td>- Augmentative/alternative communication services</td>
<td>- Can continue from preschool</td>
</tr>
<tr>
<td></td>
<td>- Goal is the development of effective communication system</td>
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</tbody>
</table>
### Resource Binder

#### Personnel, (cont’d)

<table>
<thead>
<tr>
<th>Profession</th>
<th>Role</th>
<th>How to Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physiotherapist</td>
<td>- Assessment and program planning</td>
<td>- Referral from physician or specialized setting</td>
</tr>
<tr>
<td></td>
<td>- Provision of specialized equipment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Consultation on exercises, sitting postures, muscle control</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Goal is motoric independence</td>
<td></td>
</tr>
<tr>
<td>Occupational therapist</td>
<td>- Assessment and program planning</td>
<td>- Referral from physician or specialized setting</td>
</tr>
<tr>
<td></td>
<td>- Development of a range of fine/gross motor skills with a focus on independence (e.g., drinking from a cup)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Recommendations for activities at school and at home</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Goal is to enhance student’s independence</td>
<td></td>
</tr>
<tr>
<td>Outreach teacher from ABI rehabilitation facility</td>
<td>- Provide ABI specific knowledge on strategies specific to a particular student</td>
<td>- Parents may make referral</td>
</tr>
<tr>
<td></td>
<td>- Will act as ongoing resource to school team</td>
<td>- Teachers may contact with permission of parents</td>
</tr>
<tr>
<td>Local community brain injury associations</td>
<td>- Offer excellent background information on needs of students with ABI</td>
<td>- Anyone may call</td>
</tr>
</tbody>
</table>
7.4 - Other
Related Professionals

<table>
<thead>
<tr>
<th>Profession</th>
<th>Role</th>
<th>How to Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neuropsychologist</td>
<td>- Follow-up</td>
<td>- Referral from family physician, school, insurer or self.</td>
</tr>
<tr>
<td></td>
<td>- Cognitive, psychological, neuropsychological, behavioural assessment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Collaborative programming</td>
<td></td>
</tr>
<tr>
<td>Neurologist</td>
<td>- Neurological assessment</td>
<td>- Referral from family physician</td>
</tr>
<tr>
<td>Pediatrician</td>
<td>- Developmental and medical assessment</td>
<td>- Referral from family physician</td>
</tr>
<tr>
<td>Psychiatrist</td>
<td>- Medical management of neuroleptics and psychiatric presentations</td>
<td>- Referral from family physician</td>
</tr>
<tr>
<td>Insurance people</td>
<td>- Access to funding support</td>
<td>- Depends on relevant policy (automobile, health)</td>
</tr>
<tr>
<td>Case Manager</td>
<td>- Manage and coordinate services</td>
<td>- Depends on severity classification</td>
</tr>
<tr>
<td>Public Health Nurse</td>
<td>- Dealing with public health concerns of development, safety, and general medical nature</td>
<td>- Through local regional services</td>
</tr>
</tbody>
</table>
7.5 - Things to Remember When Accessing Help

- It is essential that one person coordinate the efforts of the team.
- There will be varying levels of knowledge among parents and professionals.
- Different stages of recovery/rehabilitation will require the involvement of different members of the team.
- The process will be more complex because of the possibility of dealing with varying ministries (health) as well as private organizations (insurance).

7.6 - A Team Approach to Assessment

An effective assessment incorporates a variety of sources to build a complete picture of a student's capabilities. It is only when this complete picture is examined, that members of a team can begin to program effectively for students with ABI.

Assessment information should come from a variety of sources including:

- Parents
- Educators
- Medical personnel
- Other related professionals
- Where appropriate, the students themselves

Information collected from only one source will reveal only a partial understanding of the nature of the student’s capabilities and thus prove ineffective for programming.
Educating Educators

In special education in general, and certainly in the case of ABI where terminology and medical overtones may serve to intimidate, there may tend to be an over-reliance on standardized assessment measures. It is because of the complexity of the condition that something as seemingly simple as “teacher observation” may appear unimportant in the overall assessment process. Nothing could be further from the truth. Frontline educators have a unique opportunity to observe students over prolonged periods of time both as individuals and within a group setting. In the case of ABI it is likely that an educator may be the best source of information with regard to pre-injury performance and thus be in a position to make some comparisons. Working collaboratively with the in-school team and the parents, important data that can lead to effective programming can be collected just through watching!

Tips for good observation

- Keep notes
- Observe within a variety of settings (working independently, within a group)
- Observe across subject areas
- Do not forget the social aspects of education
- Be aware of time (is the student more fatigued in the morning?)
- Be aware of any bias you may have in observing
- Enlist the viewpoints of others.
Why is a neurological assessment necessary?

Neuropsychological information, measured utilizing standardized types of formal assessment, can be extremely useful in the development of an effective program only if combined with additional information provided by educators. Information provided by educators may consist of observational data, samples of the student’s work, information about pre-injury performance as well as information about classroom structure, the availability of differentiated learning environments, and personnel. No information is useful in isolation. If, for example, an assessment yields the result that auditory memory is severely impaired, then a team approach can establish first, whether this information is compatible with the observations of the educators involved, and second, how to best accommodate the learning needs given the constraints of the student’s educational environment.

Brain injury can affect a student’s performance along a large spectrum of functioning. Because the brain is multi-departmental, the location of injury is very important in terms of how it affects functioning. Cognitive/neuropsychological assessment can assist in differentiating areas of deficit that may affect performance and thus provide valuable information for programming.

While traditional achievement tests and intelligence tests play a role in assessing a student with an ABI, it must be remembered that they will, by and large, be measuring pre-injury learning and not the post-injury ability to learn. Therefore, it is most important that specialized tests to measure current specific cognitive function be used.
Educating Educators

For students with an ABI, an assessment which focuses solely on an examination of their academic and social achievement in comparison to their peers or curriculum expectations alone will not provide the necessary information to develop an effective program. For these students, assessment must focus on their current cognitive (memory, problem-solving ability, spatial awareness, etc.) functioning as it relates to academic and social settings. When assessment fails to take into account "how the student thinks" there can be a continued decline in the student’s performance post-injury. This decline may appear to be a continued effect of the student’s injury, while in reality, continued decline presents in a very small percentage of individuals who have sustained an ABI. It is far more likely that a student with an ABI, who is failing to learn, may be doing so as a result of a mismatch between factors such as the learning environment, pace of instruction, mode of delivery, and the underlying cognitive limitations and strengths of the student. For example, a child who, as a result of the injury, needs to be presented with new material in a visual way, will fail to learn in a class that relies heavily on auditory instruction.

Understanding that some cognitive skills (e.g., flexible attention-shifting, organization, modality of learning, processing speed) have been altered or diminished, can assist the educator in developing a program that will allow the student to avoid academic frustration and learn more effectively. With an awareness of cognitive strengths, programming can be adjusted to meet the needs of students with ABI. Accommodations as simple as providing information through the student’s modality strength (e.g., auditory), providing the student with an explicit step-by-step approach to organizing a task, and slowing down, can dramatically improve the student’s ability to learn new material successfully.
Who initiates a neurological assessment?

A neurological assessment may be initiated by a medical doctor, an insurance company, a lawyer, or a case manager at a rehabilitation facility. Within a school setting, if an assessment has not been done upon return to school, a special education teacher may initiate testing through contact with the school board special education staff. Often, only a portion of the testing needed can be done at the school level. In many cases, tests such as those that measure intellectual functioning in terms of IQ as well as achievement assessments may be administered through school board personnel. Where more sophisticated testing is required, a neuropsychologist will be required.

When is a neuropsychological assessment done?

In the case of ABI, there may not be any pre-existing information other than that which is normally acquired throughout a student’s schooling. Copies of report cards, group-administered assessments and screenings at the preschool level are generally accumulated throughout a student’s school career. While these types of information will be helpful in developing a complete picture of the student’s past functioning, it should be noted that a student’s ability to acquire, retain and utilize new learning may be dramatically altered as a result of the brain injury.

In the case of a student who has experienced an ABI, assessment is not recommended for students immediately following the injury. Often physical complications, along with a rapid recovery period may render assessment results unreliable. Students may also be restless, agitated, fatigued and confused during this time. Only when a student has stabilized and is able to focus for periods of time is an assessment recommended. This is generally around the 6-month mark. As recovery can last for up to 2 years, follow-up assessments at regular intervals are essential to fine-tune and adapt instruction to meet the student’s changing needs.
In addition to traditional testing tools such as IQ testing (e.g., WISC-III) and tests of academic achievement (e.g., WIAT), assessment in the case of a student with ABI will most likely include tests of:

- individual cognitive skills such as memory (CMS),
- verbal learning (CVLT-C),
- executive/organization and planning skills (CCT),
- overall neuropsychological development function (e.g., visual attention, planning, problem-solving, phonological processing, processing speed, comprehension, visuomotor precision and auditory memory [NEPSY]).

(See Appendix 9-2 for information on specific tests.)
When a student returns to school having sustained an ABI, assuming that the child had not been identified as exceptional in another capacity, there may be very little testing done beyond that which is normally completed on students at a particular grade level.

Psychological testing, such as the establishment of an IQ score, as well as examinations of other types of cognitive functioning will be completed by a psychologist.

A good neuropsychological assessment should clearly define a student’s cognitive strengths and weaknesses. Using this information, combined with ongoing observations by the educators, the special education personnel, in cooperation with the neuropsychologist (and perhaps special education personnel from an ABI rehabilitation facility) team members will be able to develop and implement effective programming strategies. It should be expected that the development of effective learning strategies will require ongoing observations of the student’s success and possible modifications to the strategies. This is particularly true for a student with an ABI due to the changes that occur as a result of recovery.

The intent of a good assessment is to provide information about the child’s current level of cognitive functioning. It should provide a clear profile of the student’s strengths and weaknesses across a number of cognitive skills. It should also provide examples of how the student presents with her/his apparent strengths and weaknesses in the context of her/his learning environment. With this information, educators should be able to articulate specific strategies and accommodations in teaching style and material exposure that will enhance the child’s abilities and de-emphasize and/or compensate for the inabilities.

Who is responsible for assessing a student with ABI?

What to do with the results of an assessment
What can the teacher do to assess the possibility that she/he has a child with an ABI in the classroom?

You may have a child who has sustained an ABI if she/he experiences any, but typically combinations of the following:

- **Attention Difficulties:** Students experience trouble sustaining attention for prolonged periods of time; or they cannot perform two tasks at once (take notes and listen to the teacher). Often they are better with visual and written material than with oral and auditory material since they can review and re-attend to the written material at their own leisure, but once the auditory information has been given, it is gone.

- **Slowed Rate of Processing:** Students will almost invariably be slower to intake and process information, and will be slower to respond (verbally, physically) than their cohorts.

- **Memory Failure:** Students will have long-term, substantial learning and memory difficulties in terms of encoding the information, storing it for permanent later access, and retrieving the information at a later time. They are more successful at recognizing previously experienced material than they are at recollecting it.

- **Executive Function:** Students typically will have difficulty with the skills that allow one to monitor and manage one’s knowledge base (e.g., organize information, sequence and prioritize information, plan ahead, anticipate outcomes, shift topics/thoughts, think abstractly, make sound, informed judgements).
These difficulties become more obvious in older children since the demands for these sophisticated skills are more apparent as one progresses through the academic system.

So, ask yourself:

Is the student able to:

- Concentrate? How long?
- Mentally manipulate information (e.g., do math in her/his head?)
- Do two things at once (e.g., write notes, and listen to instruction simultaneously?)
- Concentrate on visual versus oral information?

Is the student:

- Accurate, but slow to respond or complete things?
- Accurate when there are no time limitations (e.g., timed versus untimed test?)

Does the student:

- Have difficulty in retaining new information?
- Improve with context information for learning?
- Increase learning with repetition?

Does the student:

- Have problems prioritizing, organizing, and/or sequencing information and are these corrected when an organization plan is provided to her/him?
- Have difficulty in following through a commitment?
- Have difficulty shifting “cognitive set”/thoughts/approach when the task demands, environment or situations have changed?
Chapter 8
Role of the Parents

8.1 Myths and Misconceptions
8.2 Role of the Parent
8.3 Words of Caution
8.4 General Tips for Talking With Parents
### 8.1 - Myths and Misconceptions

<table>
<thead>
<tr>
<th>Myth:</th>
<th>Fact:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational decisions are solely the</td>
<td>The ultimate responsibility for all decisions about a child lies with</td>
</tr>
<tr>
<td>responsibility of the educator and school</td>
<td>the parents. Therefore, it is essential that educators seek their</td>
</tr>
<tr>
<td>staff.</td>
<td>input and give them a central role on the team.</td>
</tr>
<tr>
<td>Parents always know that their child has</td>
<td>Some mild brain injuries are never medically diagnosed. In addition,</td>
</tr>
<tr>
<td>sustained a brain injury.</td>
<td>impairments resulting from a brain injury that occurred at an early</td>
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<td>age may not manifest themselves for several years due to the</td>
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<td>Special education resource personnel at the</td>
<td>developmental nature of the brain.</td>
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<td>system level are generally well-informed</td>
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<td>about brain injury.</td>
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<td>Until very recently, there has been almost no mention of ABI in</td>
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<td>faculties of education training courses. ABI is still not recognized</td>
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<td>as a distinct disability by the Ministry of Education.</td>
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</table>
8.2 - The Role of the Parent

Educators come and go out of a student’s life from year to year, but parents are a constant as the student progresses through school. This means that the parents can be an invaluable resource in the educational process. This can be especially true for the parents of a child with ABI.

If the ABI has reached a critical turning point in a student’s life, the parents are often driven to learn about the nature of their child’s disability and can become quite knowledgeable with regard to ABI. Because of this, parents can be an invaluable part of the educational team by providing:

- Information about the nature of the injury and the resulting physical, cognitive, emotional and behavioural impairments.
- Information about the developmental progress and/or learning styles of the student prior to the injury.
- A link to the medical and rehabilitation professionals who may be able to offer valuable input into strategies that may work or may be worth investigating.
- A link during periods of transition from grade to grade or school to school.
- Information on the student’s reaction to school when the student is not at school. (A parent who reports that a student is doing 5 hours of homework a night to keep up with his Grade 6 class assignments is providing the educator with a major alert that curriculum or strategies need to be adjusted.)
- Information about the student’s social interactions, interests, likes, dislikes, etc.
- A model of a positive attitude towards school and learning. (Parents who haven’t been made to feel as though they are a valued part of the
Educating Educators

- Assistance in helping the student practice and further develop skills learned at school.

Parents of children who have sustained an ABI have most likely been through an extremely traumatic experience and therefore are even more cautious and protective of their child.

Try to see student from the parents’ perspective.

Parents who have lived through the terror of a severe trauma to their child may have a very special perspective on that child and the school. They may have been told that their child might never walk or talk again. They may have been told that their child would not live, except perhaps in a comatose state. If they have seen their child defy the worst of the medical prognostications, they may feel they have witnessed a “miracle.” In fact, in many cases the miracle happened only with the commitment and dedication of parents who continued to work and to hope when others had lost hope for the child’s recovery. Such parents may see the delays in learning or the disruptive behaviours as minor compared to what they had been led to expect.

Help parents develop a realistic view of their child’s performance.

It is not uncommon for some parents to struggle with acceptance of their child’s brain injury, especially if the physical symptoms have healed and disappeared. In such cases, parents may be experiencing extreme frustration, and may need some help to understand that what is perceived as “a lack of effort” or “defiant and disruptive behaviour” may be the result of the brain injury. Parents who are in this state may need help from the educator, the school psychologist, or other professionals to come to a realistic view of their child’s performance.
If it is determined that a student is going to receive special education support, it is important to remember that the parents, as well as the student, may be entering the field of special education for the first time. This can be an overwhelming experience, filled with jargon and procedures familiar to schools and school staff but foreign to parents. Be sure to take time to allow the parents to gain information at a comfortable rate and adjust to the changed perspective and plan for their child.

Many brain injuries go undiagnosed or are forgotten when the student appears to make a complete recovery. Later, as the student progresses through the developmental stages and reaches an age when higher-level academic challenges present themselves, suddenly he or she is unable to cope. It is easy to jump to the conclusion that the student has stopped trying. In such cases, it is always wise to look for other causes, including investigating with parents any possible physical cause for the change in performance.

Because there are often no outward signs of ABI and because each ABI manifests itself in different ways and requires different strategies, educators need to make themselves familiar with the disability or at least be aware of the sources of assistance when a student with an ABI presents special challenges in the classroom. In some cases, the best information and resources may come from the parent, but in other cases it is the educator who can lead this discussion and present valuable information.
While it is crucial to remember that the diagnoses of an ABI rests solely within the realm of medicine, educators are in a unique position to observe students over a long period of time and within the context of a similar-age peer group. This opportunity for observation and collecting information is invaluable in compiling a complete picture of a student’s academic, social and emotional functioning. Whenever a student is not performing well, for whatever reason, it is always a good idea for the educator to share her/his concerns with parents as soon as a pattern of poor performance is evident. This is best done in a face-to-face meeting, if at all possible.

In looking for explanations for the student’s performance problems, it is wise to gather information with regard to the student’s physical well-being. In addition to questions about general health, current sleeping and eating patterns and past diseases and illness, it is advisable that a question regarding trauma to the head be included.

It is terribly important not to be an alarmist and certainly not to suggest that there could be damage to the brain, however, it is not unheard of to have a parent respond with an answer that reveals a significant trauma that had occurred years earlier and since has been forgotten because the student seems to have recovered.

It is appropriate to ask parents about a student’s current and past health conditions, but drawing conclusions from the answers is inappropriate. If the answers that parents give lead you to suspect a medical problem of any kind, it is best to recommend that the student be taken to a physician and that the physician be made aware of any present symptoms or past diseases or injuries.
8.4 - General Tips for Talking With Parents

- Welcome the parents’ participation.
- Assure parents that information will remain confidential.
- Consider the physical setting for conversation (do not have a desk between you and the parents).
- Be aware of voice tone and body language (yours and theirs).
- Avoid jargon.
- Be open to the perspectives of others. Do not assume that your version of the facts is the only valid one.
- Work at establishing a partnership of equals. Have as a goal, shared ownership and shared responsibility.
- Do not monopolize the conversation.
- Remember that parents often have a wealth of information about their own child. Be open to allowing them to educate you.
- Do not feel that as the educator you have to “know everything.” This is impossible! What is important is the willingness to find out.
- Keep in mind that differing cultural and social economic factors do not imply poor parenting.
- Do not take things personally. Often there are factors and frustrations that have very little to do with the current educational situation.
- Make every effort to maintain the parents’ dignity, particularly where there are socio-economic, cultural or language issues.
- Bear in mind that most parents are doing the best they can.
Educating Educators

8.5 - Strategies for Maintaining Regular Parent-Teacher Communication

- Determine the preferred mode of communication (e.g., telephone, written notes, face-to-face meetings, e-mail, etc.)
- Establish how often and when communication will occur.
- Have a meeting agenda that lists items that need to be discussed.
- Do not focus only on problems the student is experiencing, but remember to discuss the accomplishments as well.
- Encourage the parents to participate by allowing them to provide relevant information about the student and encourage them to share the decision-making responsibility.
- Make parents aware of their rights and responsibilities regarding the development and implementation of an Individual Education Plan.
Chapter 9
Appendices

9.1 Acronyms
9.2 Neuropsychological Tests
9.3 Brain Injury Quiz
9.4 Glossary
9.5 References
9.6 Index
### 9.1 - Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
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<tbody>
<tr>
<td>ABI</td>
<td>Acquired Brain Injury</td>
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<tr>
<td>ACL</td>
<td>Association for Community Living</td>
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<tr>
<td>ADD</td>
<td>Attention Deficit Disorder</td>
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<tr>
<td>ADHD</td>
<td>Attention Deficit Hyperactivity Disorder</td>
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<tr>
<td>AEP</td>
<td>Annual Education Plan</td>
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<tr>
<td>ANS</td>
<td>Autonomic Nervous System (one of the 2 branches of the PNS)</td>
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<tr>
<td>BEH</td>
<td>Behaviour</td>
</tr>
<tr>
<td>CAP</td>
<td>Central Auditory Processing</td>
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<tr>
<td>CBA</td>
<td>Curriculum Based Assessment</td>
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<tr>
<td>CCAT</td>
<td>Canadian Cognitive Achievement Test</td>
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<tr>
<td>CNIB</td>
<td>Canadian National Institute for the Blind</td>
</tr>
<tr>
<td>CNS</td>
<td>Central Nervous System (brain and spinal cord)</td>
</tr>
<tr>
<td>CPRI</td>
<td>Child Parent Research Institute (London)</td>
</tr>
<tr>
<td>CT</td>
<td>Computerized (Axial) Tomography “CAT Scan”</td>
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<tr>
<td>DD</td>
<td>Developmental Disability</td>
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<tr>
<td>EA</td>
<td>Educational Assistant</td>
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<tr>
<td>EQAO</td>
<td>Educational Quality Accountability Office</td>
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<tr>
<td>ESL</td>
<td>English as a Second Language</td>
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<tr>
<td>FACS</td>
<td>Family and Children’s Services</td>
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<tr>
<td>FAE</td>
<td>Fetal Alcohol Effect</td>
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<tr>
<td>FAS</td>
<td>Fetal Alcohol Syndrome</td>
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<tr>
<td>SEPPA</td>
<td>Special Education Per Pupil Amount</td>
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<tr>
<td>SERT</td>
<td>Secondary Resource Teacher</td>
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<tr>
<td>SLP</td>
<td>Speech and Language</td>
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<tr>
<td>GLD</td>
<td>General Learning Disabilities</td>
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<tr>
<td>IEP</td>
<td>Individual Education Plan</td>
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<tr>
<td>ISA</td>
<td>Intensive Support Amount</td>
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<tr>
<td>IST</td>
<td>In-School Team</td>
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<tr>
<td>LD</td>
<td>Learning Disability</td>
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<tr>
<td>LDA</td>
<td>Learning Disabilities Association</td>
</tr>
<tr>
<td>LRT</td>
<td>Learning Resource Teacher</td>
</tr>
<tr>
<td>MET</td>
<td>Ministry of Education and Training</td>
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<tr>
<td>MID</td>
<td>Mild Intellectual Disability</td>
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<tr>
<td>MRI</td>
<td>Magnetic Resonance Imaging</td>
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<tr>
<td>NEPSY</td>
<td>Neuropsychological Development in Children</td>
</tr>
<tr>
<td>OCD</td>
<td>Obsessive Compulsive Disorder</td>
</tr>
<tr>
<td>ODD</td>
<td>Oppositional Defiance Disorder</td>
</tr>
<tr>
<td>OSR</td>
<td>Ontario School Record</td>
</tr>
<tr>
<td>OT</td>
<td>Occupational Therapist</td>
</tr>
<tr>
<td>PDD</td>
<td>Pervasive Developmental Disorder</td>
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<tr>
<td>PNS</td>
<td>Peripheral Nervous System</td>
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<tr>
<td>PPVT</td>
<td>Peabody Picture Vocabulary Test</td>
</tr>
<tr>
<td>PT</td>
<td>Physiotherapist</td>
</tr>
<tr>
<td>PTA</td>
<td>Post Traumatic Amnesia</td>
</tr>
<tr>
<td>RT</td>
<td>Resource Teacher</td>
</tr>
<tr>
<td>SALEP</td>
<td>Supervised Alternative Learning for Excused Pupils</td>
</tr>
<tr>
<td>SEAC</td>
<td>Special Education Advisory Council</td>
</tr>
</tbody>
</table>
Resource Binder

Pathologist

**TBI** Traumatic Brain Injury

**TP** Transition Plan

**WAIS–III** Wechsler Adult Intelligence Scale, 3rd Edition

**WIAT–II** Wechsler Individual Achievement Test, 2nd Edition

**WISC–III** Wechsler Intelligence Scale for Children, 3rd Edition

**WPPSI–II** Wechsler Preschool and Primary Scale of Intelligence, 2nd Edition

**WRAT–III** Wide Range Achievement Test, 3rd Edition
### 9.2 - Neuropsychological Tests

<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
<th>Age Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEPSY</td>
<td>Neuropsychological Development in Children&lt;br&gt;Description: Measures basic and complex aspects of cognitive capacities that are critical to a child's learning in the areas of attention, language, sensorimotor skills, visuospatial processing, memory and learning.</td>
<td>3 - 12 years</td>
</tr>
<tr>
<td>D-KEFS</td>
<td>Delis-Kaplan Executive Function System&lt;br&gt;Description: Assesses higher level cognitive functions (reasoning, problem-solving, planning, etc.)</td>
<td>8 - 89 years</td>
</tr>
<tr>
<td>WAIS - III</td>
<td>Weschler Adult Intelligence Scale, 3rd Edition&lt;br&gt;Description: Measures general cognitive and intellectual ability, provides sub-measures in verbal and nonverbal reasoning skills.</td>
<td>16 - 84 years</td>
</tr>
<tr>
<td>WISC - III</td>
<td>Weschler Intelligence Scale for Children, 3rd Edition&lt;br&gt;Description: Measures general cognitive and intellectual ability, provides sub-measures in verbal and nonverbal reasoning skills.</td>
<td>6 - 17 years</td>
</tr>
<tr>
<td>WPPSI - III</td>
<td>Weschler Preschool and Primary Scale of Intelligence, 3rd Edition&lt;br&gt;Description: Measures general cognitive and intellectual ability, provides sub-measures in verbal and nonverbal reasoning skills.</td>
<td>3 - 7 years</td>
</tr>
<tr>
<td>SB-IV</td>
<td>Stanford-Binet Intelligence Scale, 4th Edition&lt;br&gt;Description: Measures cognitive abilities that provide an analysis of the pattern as well as the overall level of cognitive development, provides sub-measures in verbal reasoning, abstract/visual reasoning, quantitative reasoning and short-term memory.</td>
<td></td>
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</tbody>
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### Neuropsychological Tests, (cont’d)

<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
<th>Age Range</th>
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</thead>
</table>
| **WIAT - III** | Wechsler Individual Achievement Test, 3rd Edition  
Description: Measures basic reading, reading comprehension, total reading, mathematical reasoning, numerical operations, total mathematics, listening comprehension, oral expression, total language, spelling, written expression, total writing. | 5 - 20 years, Grades K - 12 |
| **WRAT - III** | Wide Range Achievement Test, 3rd Edition  
Description: Measures basic reading, spelling, and mathematics skills with two alternative test forms. | 5 - 75 years   |
| **CMS**    | Children's Memory Scale  
Description: Comprehensive assessment of verbal and nonverbal memory and learning skills. | 5 - 16 years   |
| **BBCS**   | Bracken Basic Concept Scale  
Description: An assessment of a child's conceptual knowledge. | 2.5 - 8 years   |
| **QNST**   | Quick Neurological Screening Test  
Description: Assesses areas of neurological integration as they relate to learning. | 6 - 17 years +  |
| **RAVEN'S** | Raven's Progressive Matrices  
Description: A nonverbal assessment of perception and thinking skills. | 6 - 65 (coloured form for 5 - 11 years; advanced form for 11 years +) |
Neuropsychological Tests, (cont’d)

<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
<th>Age Range</th>
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</thead>
<tbody>
<tr>
<td>BASC</td>
<td>Behaviour Assessment System for Children. A multi-dimensional approach to evaluating the behaviours, emotions and self-perceptions of children.</td>
<td>2.5 - 18 years</td>
</tr>
<tr>
<td>CDI</td>
<td>Children's Depression Inventory. A symptom-oriented scale to assess depression in children over time.</td>
<td>7 - 17 years</td>
</tr>
<tr>
<td>MMPI - A</td>
<td>Minnesota Multiphasic Personality Inventory for Adolescents. Assesses various clinically important aspects of personality.</td>
<td>14 - 18 years</td>
</tr>
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</table>
9.3 - Brain Injury Quiz

Please answer the following True and False questions (circle either the T or the F)

1. Even after several weeks in a coma, when people wake up, most recognize and speak to others right away.
   T  F

2. Sometimes, a second blow to the head can help a person remember things that were forgotten.
   T  F

3. A little brain damage doesn’t matter since people only use a part of their brains anyway.
   T  F

4. How quickly a person recovers from a brain injury depends mainly on how hard they work at recovering.
   T  F

5. A person who has recovered from a brain injury is less able to withstand a second blow to the head.
   T  F

6. Complete recovery from a brain injury is not possible, no matter how badly the person wants to recover.
   T  F

7. People who have had one brain injury are more likely to have a second one.
   T  F

8. After a brain injury, it is usually harder to learn new things than it is to remember things from before the injury.
   T  F

9. Unwanted behaviours which are reinforced every time they occur are easier to extinguish than behaviours which are reinforced on a periodic but consistent basis.
   T  F

10. Skills are more likely to be retained by individuals with a brain injury if they are taught in the place in which the skills will be used.
   T  F

11. A person who has a handicap also must have an impairment.
    T  F

12. An individual with a brain injury requires substantially more alcohol to achieve an impaired state than she/he would have required prior to the injury.
    T  F

13. After a brain injury, a person can forget who they are and not recognize others in his or her family but be normal in every other way.
    T  F

14. People who are impaired by alcohol at the time of trauma are less likely to experience brain swelling, lesions and bleeding.
    T  F

15. A brain injury heals with time and physical recovery is a sign that the brain has healed.
    T  F

16. A mild brain injury can affect a child’s ability to concentrate, learn and function in the classroom.
    T  F
# Educating Educators

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<tbody>
<tr>
<td>1</td>
<td>Normal IQ scores after a brain injury indicates that a child will have no trouble in the classroom.</td>
</tr>
<tr>
<td>8</td>
<td>All learning disabilities can be addressed by similar strategies.</td>
</tr>
<tr>
<td>9</td>
<td>Brain injuries affect a student’s self-awareness and ability to regulate her/his own behaviour.</td>
</tr>
<tr>
<td>20</td>
<td>Emotional and behavioural problems take up most of time in the classroom.</td>
</tr>
</tbody>
</table>

* Note Concerning Misconceptions of the General Public About Brain Injury (Willer et al, 1993)
9.4 - Glossary

- A -

**Acquired Brain Injury (ABI)** - Any type of sudden injury that causes temporary or permanent damage to the brain. It is divided into two categories: traumatic and non-traumatic.

**Active Ignoring** - This is the continued monitoring of an individual's behaviour while deliberately not responding or reacting to the behaviour. This approach is designed to decrease the frequency of an unwanted behaviour by not reinforcing it.

**Agnosia** - The inability to recognize objects. This is a modularity-based deficit that exists following an injury to the brain even though basic sensory processing in the affected modality and memory are intact. Can occur in any modality. For example, in auditory agnosia, the individual knows a sound has occurred but does not know the significance of the sound while in tactile agnosia, objects cannot be recognized through touch.

**Agraphia** - The inability to produce written language. There are two routes to the production of the written word. The first route involves a direct transfer of thoughts to written words and the second is mediated by phoneme (sound) to grapheme (written symbol) correspondence rules. Individuals may experience difficulty with either route or both routes depending upon the location and amount of damage to the parietal lobe. Individuals who experience agraphia cannot write sentences or experience great difficulty doing so.

**Alexia** - The inability to read. This involves an inability to perceive written words. There are two routes to reading. In the phonological route, the sound of the letters acts as a mediator between the written word and the meaning. In the direct route, the printed word is directly associated with the meaning (occurs in cases where the words do not follow grapheme [written symbol] to phoneme [sound] rules). Individuals may experience difficulty with either route or both routes depending upon the location and amount of damage to the parietal lobe. Individuals who experience alexia cannot read sentences or experience great difficulty doing so.

**Amygdala** - It is part of the limbic system. It is strongly connected with emotional functioning. Research has shown that mammals with damage to the amygdala experience difficulty making sense of and/or responding appropriately
to the affective elements of sensory stimuli. Individuals who experience damage in this area may show an inability to respond appropriately to emotional input (i.e. other’s feelings) and/or to access and use affective information.

**Aneurysm** - A broken blood vessel in the brain. It disrupts the blood supply to the brain. Considered to be a vascular injury.

**Anomia** - The inability to name objects.

**Anoxia** - Lack of oxygen. Causes include but are not limited to near drowning, suffocation and choking.

**Antecedent-Based Approach** - An approach in which the focus is on what is driving the unwanted behaviour. Identifying the antecedent (what happens to elicit the behaviour) and then modifying the environment/situation accordingly is seen to be the key in decreasing the unwanted behaviour.

**Aphasia** - Difficulty understanding/processing spoken language.

**Ataxia** - Failure in muscle control (e.g., limb may shake making it difficult to use the limb).

**Axonal Fibres** - The fragile fibres that extend from one neuron towards another neuron. These fibres facilitate the transfer of electrical and chemical signals/information from one neuron to another thus allowing the neurons to communicate.

**Axons** - One of the main parts of a neuron. It is the long shaft of the cell that facilitates the transfer of electrical information. Most axons are covered in a myelin sheath which speeds the conductance of the electrical signal.

**Back Door Approach** - This is an intervention approach in which the interventions are utilized without the person being aware or confronted and/or the interventions used are compatible but not identical with what the person is doing. It is very useful in cases where the individual is not aware of difficulties and truly believes that she/he does not have a problem. In this case, it is not productive to confront the individual with the difficulty but rather to find a way to address the issue indirectly.

**Basal Ganglia** - This term refers to a small group of neurons located deep in the cerebral hemispheres on either side of the thalamus. These structures are responsible for the control of voluntary and involuntary movement.

**Bilateral Audition** - Each ear passes messages about what has been
heard to the primary auditory cortex of each hemisphere. Therefore, information about what is heard from the environment is processed by both hemispheres or bilaterally. Damage to the primary auditory cortex in one hemisphere means that the primary auditory cortex in the other hemisphere can still function. There will be some impairment, particularly with identifying the location of a sound as location is established by comparing the messages coming from each ear.

**Brain Drain** - This refers to cognitive fatigue. Individuals who have experienced an ABI often experience cognitive fatigue as the brain tries to cope with the incoming knowledge. This will be particularly pronounced early in recovery and in new or challenging situations. However, it often persists and is part of the long-term effects of the injury. It is also experienced by individuals who have not experienced an injury although it occurs less often. The experience of cognitive fatigue is associated with a sense that no more information can be processed, feeling cognitively overwhelmed and may also involve a cloudy feeling in the head. The individual experiencing the fatigue may appear to be day-dreaming or seem dazed, the eyes may be unfocused, the face may be pale and the individual may attempt to leave the situation. The individual may experience better success with hard topics and assignments in the morning before the fatigue has a chance to occur.

**Brain Stem** - It is located at the base of the brain and extends down to become the spinal cord. It includes three main parts, the medulla, the pons and the midbrain. It controls basic involuntary life functions, sleep onset and level of alertness.

**- C -**

**CAT Scan** - Computerized axial tomography otherwise known as a CT or CAT scan. This is an imaging technique that is used to examine the brain with x-rays. It provides information about the density of brain structures. It is commonly used to check for damage to the brain. However, diffuse and/or minor damage is not always identified by these scans.

**Cerebellum** - This region of the brain is located to the posterior of the medulla. It controls balance, timing and equilibrium. It also controls the coordination of fine and gross motor movements such as walking, sitting,
down and the manipulation of objects.

Cerebral Hemisphere (Left) - The left half of the cortex. It is responsible for the processing and analysis of information. This hemisphere is specifically involved in logical, sequential and analytical aspects as well as details and deductive reasoning. It is associated with a number of specialized skills including: verbal abilities; lexical aspects of relative special abilities; relationships between self and the environment; analytical space-time concepts (e.g., numerical operations); language (speaking, listening, reading, writing). The left hemisphere is also responsible for the right side of the body’s skeletal muscles and somatosensation. It interprets the left visual field and is home to bilateral audition.

Cerebral Hemisphere (Right) - The right half of the cortex. It is responsible for the processing and analysis of information. This hemisphere is specifically involved in holistic, global, parallel processing, comprehension and inductive reasoning. It is associated with a number of specialized skills including: spatial abilities (knowing directions especially in three dimensional space without reference); solving puzzles; drawing pictures; recognizing objects and people; nonverbal language (timing, intention, pragmatics); space-time complex concepts (e.g., physics). The right hemisphere is also responsible for the left side of the body’s skeletal muscles and somatosensation. It interprets the right visual field and is involved in audition.

Cerebral Vascular Accident (CVA) - Occurs when there is sudden loss or diminishment of consciousness, sensation and/or voluntary movement due to the obstruction or rupture of a blood vessel in the brain.

Cerebrospinal Fluid - It is a substance that provides cushioning for the brain and spinal column. It acts as a buffer between these structures and the bones that encase them. It is similar in consistency to blood plasma and transports nutrients to the neurons.

Cerebrum - It is considered to be the location of higher mental processes. It consists of the cerebral hemispheres and associated connecting structures.

Chronological Age - An individual’s age as measured from her/his date of birth to a specific time.

Cingulate Gyrus - It is the medial gyrus of each of the cerebral
hemispheres. It partially surrounds the corpus callosum.

**Clonic Movement** - It involves a pattern that alternates between the contraction and partial relaxation of complex groups of skeletal muscles. It often occurs in relation to some diseases of the nervous system and is associated with seizure activity. Research has suggested that it is associated with a variation in the normal pattern of motor neuron discharge.

**Closed-Head Brain Injury** - In this type of injury the skull is not penetrated but remains intact. The brain is jolted around inside the skull resulting in bruising and injury. The brain often swells and experiences blood vessel rupture resulting in hematomas. Both of these conditions result in further damage. Although, there may be only one point of initial impact, the resulting damage is diffuse in nature, affecting many different brain regions.

**Colour Agnosia** - This is a difficulty in identifying colours associated with damage to the brain.

**Concrete Thinking** - This is a form of thought in which an individual interprets information literally and cannot interpret metaphors, similes, symbolism or other forms of abstract thought.

**Confabulation** - The filling in of gaps in memory and associated details through fabrication. It is a verbalization about people and events that the individual believes to be true but is only partially based on facts. It often occurs due to fragmented memories. The individual with fragmented memories fills in the gaps with details that are not true but allow the memories to make sense and seem complete.

**Contra-coup Injury** - This occurs when the brain receives a blow that is strong enough to cause it to bang against the inner wall of the skull and is followed by a rebounding of the brain off the opposite side of the skull. This “rebounding” results in contusion or bruise opposite to the initial point of impact.

**Coup Injury** - This occurs when the brain receives a blow that is strong enough to cause it to bang against the inner wall of the skull. This “banging” results in contusion or bruise at the initial point of impact.

**Cueing** - The use of a cue or type of signal to prompt another person to either engage in or disengage from a specific behaviour.
Dendrites - These structures resemble branches emanating from the cell body. They are protoplasmic processes that receive most of the contact from other neurons and conduct those impulses/signals to the body of the cell.

Differential Reinforcement - This involves using positive reinforcement when a “wanted” behaviour is observed and alternately not responding to any “unwanted” behaviours. This often involves switching rapidly between the two modes.

Diffuse Injury - This refers to an injury in which many different areas are damaged or affected. It may also be referred to as global damage.

Dyscalculia - The inability to do mathematical calculations and/or impairment of mathematical ability as the result of damage to the brain.

Dyscontrol - The inability to control behaviours due to damage to the brain.

Edema - The swelling of tissue after damage/injury.

Encephalitis - An inflammation of the brain usually caused by a virus. The are several different types of encephalitis. The prognosis for individuals who have the condition varies as the case can be relatively mild or very serious and potentially fatal. Neurological symptoms may persist for months before full recovery. May result in permanent impairment.

Focal Injury - An injury that involves a localized point of damage. This often occurs in open-head injuries or other injuries that involve a limited and specific area of damage.

Frontal Lobe - It is located at the front of the brain just behind the forehead. It provides executive control over the higher mental processes (consciousness, self-awareness, judgement, initiation/motivation, planning/sequencing, word formation, prospective memory). It is also involved in controlling emotional responses.

Grand Mal Seizure - A common type of seizure that is often associated with epilepsy but may also result from a medical illness or an unknown reason. It is usually preceded by an “aura” (abnormal sensation that
may be associated with flashing lights, a particular smell or noise) that signals the onset of a seizure. The seizure involves convulsions throughout the body usually ending with a temporary coma (minutes) followed by a residual headache and confusion.

**Gyrus** - It is a convoluted groove in between the anatomical folds/ridges of the brain. There are many different gyri in the brain each with its own associated functions.

- **H** -

**Hematoma** - It is a build-up of blood within the brain that results from ruptured blood vessels in the brain.

**Hippocampus** - It is one of the structures within the limbic system and is located deep within the forebrain. It helps regulate emotion and memory.

**Hypothalamus** - It is located directly below the thalamus at the base of the brain. It controls/regulates behaviours such as feeding, drinking, sleeping, temperature control and emotional expression that are essential to survive in the environment.

- **I** -

**Individual Education Plan (IEP)** - A written plan of action prepared for a student who requires modifications of the regular school program or associated accommodations. It is a vehicle for programming and monitoring school progress. It summarizes a student’s strengths, interests and needs. It establishes expectations for the student’s learning during the school year and acts as an accountability tool for the student, parents, and everyone else who has responsibilities under the plan to assist the student in meeting her/his goals. It is flexible and can be adjusted as necessary while providing an ongoing record that ensures the continuity of programming.

**Inhibition Impairment** - A difficulty in controlling impulses that may result in an individual acting before thinking about possible negative and/or positive consequences.

**Insomnia** - This is a disruption in the regulation of sleep. Individuals may complain of poor quality sleep, inadequate sleep and/or disrupted sleep. A person make wake throughout the night and have difficulty returning to sleep, wake early in the morning and be unable to return to sleep and/or experience unrefreshing sleep. This leads to problems with fatigue, irritability, lack of energy and difficulty concentrating during the day.
Labile Mood - This term refers to the tendency for a person’s mood or emotional expression and associated behaviours to fluctuate in a free or uncontrolled manner.

Limbic System - It is a ring-like collection of structures deep within the cerebral hemispheres adjacent to the basal ganglia. It is thought to be prominently involved in the regulation of emotional functions. The system is also associated with attention, memory and motor control.

Meninges - These are the three membranes that cover the brain and spinal cord. The outer membrane is the dura mater and is the most resilient. The middle membrane is the pia mater and the inner membrane is the arachnoid and is the thinnest of the membranes.

Meningitis - An inflammation of the meninges that is caused by various viruses and bacteria and many also be due to diseases that involve inflammation of tissue without infection. Cases vary from mild to fatal and early diagnosis and treatment is key to recovery. May result in permanent impairment.

MRI - An imaging technique used to examine the brain and other parts of the body. It operates by providing precise images of the target area through the use of electromagnetic radiation. The images can be focused on different substrates or regions of tissue. While this is a more sensitive imaging technique, it does not always identify diffuse damage.

Myelin - A fatty substance that helps conduct impulses. It is formed in sheath around the axons of neurons.

Myelination - The process of forming the fatty sheath that protects axons by specialized glial cells.

Neural Pathways - An interconnected network of neurons that communicate with each other. The neurons pass information to each other both electrically and chemically along fragile axonal fibres which are referred to as neural pathways.

Neurological Assessment - The assessment of an individual’s current cognitive functioning. Through the use of standardized tests, a trained professional examines an individual’s performance on a wide variety of
cognitive tasks that measure many different domains and abilities such as memory, attention, perception. The individual’s current performance is compared to age-appropriate norms and to previous levels of performance as indicated through academic record and other sources.

**Neurological Development** - The maturation of psychological and neurological systems within the brain.

**Neurological Exam** - A series of basic tests that involve asking an individual questions and asking her/him to perform certain actions such as touching a finger to the nose repeatedly. It also involves looking into the eyes with a light and checking sensation and reflexes. The exam can vary in the number of actions and types of procedures depending upon the situation. A scheduled neurological exam in a neurologist’s office is usually more extensive than one that is administered in an emergency room. The purpose of the exam is to assess whether or not there is any disruption in neurological functioning that would be indicative of an injury or disorder or disease. Any questionable results require further assessment.

**Neurons** - This term is used to refer to nerve cells. There are many different types of nerve cells or neurons. They send and receive signals throughout the body.

**Non-Traumatic Brain Injury** - A form of injury/damage to the brain that results from an internal source. The internal source may be anoxia (near drowning), toxicity, infection or cerebral vascular accident.

**- O -**

**Occipital Lobe** - It is located in the extreme rear of the cerebral hemisphere at the back of the brain. The occipital lobe is dedicated to vision, specifically to the detection, identification and interpretation of objects.

**Olfactory Bulb** - This is the region of the brain that processes sensory information that relates to odours. There are two bulbs, one in each hemisphere. Each bulb is a thin neural tissue located below the frontal lobe.

**Open-Head Brain Injury** - In this type of injury the skull is penetrated. The brain tissue is exposed to the outside environment resulting in an initial risk of infection and severe blood loss. The associated damage to the brain is usually focal in nature.
and therefore it is easier to predict
and identify the resulting deficits.

- P -

Parietal Lobe (Left) - It is located on
the left hemisphere towards the top
and to the back. The parietal lobe is
responsible for perceiving,
analyzing and assembling touch
information from the body. It also
integrates visual, auditory and
touch information in order to
formulate complete impressions of
the world. The left lobe is the area
where letters come together to form
words and where words are put
together in thoughts.

Parietal Lobe (Right) - It is located on
the right hemisphere towards the
top and to the back. The parietal
lobe is responsible for perceiving,
analyzing, and assembling touch
information from the body. It also
integrates visual, auditory and
touch information in order to
formulate complete impressions of
the world. The right lobe is
responsible for understanding the
spatial aspects of the world
including recognizing shapes, being
aware of one’s body in space and
deficits.

Parsing - The re-sorting and elimination
of neurons that occur as a normal
part of development.

Perseveration - A tendency to engage
in repetitive verbal or physical
behaviours.

Petit Mal Seizure - These seizures
occur most often in young children
(4-14 years) and do not involve
convulsions. The seizure is
characterized by a brief loss of
consciousness that can be
measured in seconds.

Plasticity - The brain’s ability to change
in response to the environment.
This includes the ability for other
neurons to take on new function in
response to an injury (e.g. take over
the function of an injured area).

Positive Reinforcement - Rewarding
wanted behaviour thereby
increasing the occurrence of the
wanted behaviour.

Post Traumatic Amnesia (PTA) - Loss
of memory for events following a
brain injury.

Prospective Memory - Remembering
to do something.

Prosopagnosia - An inability to
recognize faces or differentiate
faces.

- R -

Radial Cells - A type of cell that guides
the formation of neural connections.

Redirection - A method of disengaging
a person from a particular mode of
behaviour and shifting the person to
another behaviour. The purpose is to assist in shifting the person’s mindset when she/he is unable to do so independently. Instead of paying attention to the unwanted behaviour, the individual’s attention is shifted to an alternate behaviour.

**Restructuring** - This technique is used to guide an individual to construct another understanding, perspective, and/or interpretation of an event/thought/belief that will positively and/or correctly reflect the events of the situation.

**Reticular Activating System** - Located in the medulla and other regions of the brain, this system of cells is responsible for attention (alertness and arousal) as well as the regulation of sleep. Damage to this system results in coma.

**Rigid Thinking** - A type of thinking in which a person cannot consider multiple influences/variables simultaneously. The person cannot consider alternate perspectives.

**Shaken Baby Syndrome** - A syndrome that is recognized by a series of symptoms that are associated with the damage caused when an infant is severely shaken, tossed or handled in a similar manner causing internal damage to the brain. Symptoms include, but are not limited to, loss of consciousness/coma, limb paralysis, loss of vision, cognitive impairment, hematoma, hemorrhage and contusions). These injuries range in severity and may result in death.

**Sleep Apnea** - Brief periods during sleep when respiration is ceased. These periods when the individual stops breathing are associated with a disturbance in the brain’s respiratory center or a blockage in the airway. It is also characterized by daytime sleepiness.

**Somatosensation** - The sensory input from the body. Input from the skin in terms of touch and temperature as well as input from the internal organs, joints, muscles, tendons.

**Temporal Lobe (Left)** - A large, thumb-shaped extension of the cerebral hemispheres located near the temples on either side of the head. A small section at the top of each lobe is known as the auditory cortex and is responsible for hearing. The lobes are also involved in memory acquisition, perception, and the categorization of information. The left temporal lobe is specialized for
Educating Educators

the comprehension of language such as listening and reading.

Temporal Lobe (Right) - A large, thumb-shaped extension of the cerebral hemispheres located near the temples on either side of the head. A small section at the top of each lobe is known as the auditory cortex and is responsible for hearing. The lobes are also involved in memory acquisition, perception and the categorization of information. The right temporal lobe is specialized for the comprehension of music.

Thalamus - It sits at the top of either side of the brain stem in the centre of the brain. It acts as the central relay station for incoming information. It decides where incoming information must go within the cortex and sends it there to be perceived and analyzed.

Tinnitus - A ringing, buzzing or swishing in the ear.

Tonic Movement - The contraction of the skeletal muscles. This muscular contraction can be prolonged as in the case of seizures.

Traumatic Brain Injury (TBI) - An injury to the brain resulting from an external force applied to the head/brain. It is damage that is associated with some kind of trauma to the head such as a concussion, a fall or a motor vehicle collision.

- U -

Unilateral Neglect - An inability to attend to either the left or right half of a person’s visual field.

- V -

Ventral Medial Prefrontal Cortex - An area of the brain that is central in connecting feelings associated with rewards and punishments to stored memories of learning events.

Vertigo - A disordered state during which an individual’s surroundings seem to whirl dizzily.

Visual Agnosia - A failure to consciously know that one has seen an object. Although information about the object is provided through vision, the individual is not able to recognize the object although she/he may do so through another modality such as touch.

- W -

Wernicke’s Aphasia - In this syndrome, the comprehension of speech is disrupted and the production of speech is also affected. The individual’s speech will be fluent but nonsensical.
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**Word Blindness** - A difficulty in recognizing words.

**Working Memory** - This refers to short-term memory. This type of memory is used to hold information for brief periods of time and/or while a task is being performed.
9.5 - References


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