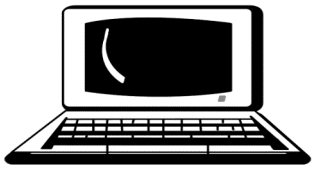
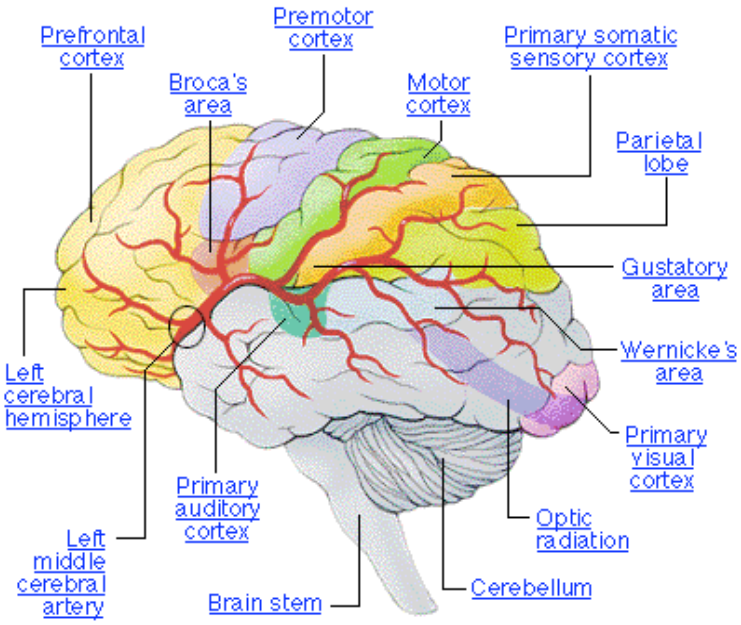


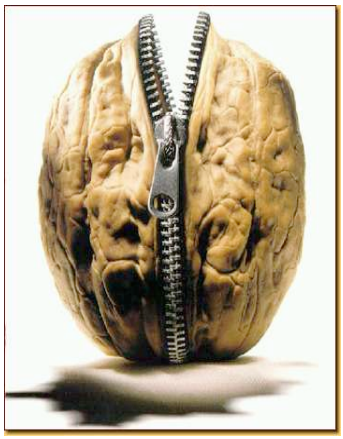
You, Me, and LD

Volume 1, Issue 6 April 21st, 2009

Prepared by: Robin C. Letendre, M.Ed.
Learning Disabilities
Consultant
robray94@myfairpoint.net



Issue 6 will be revolving around the topic of the brain and traumatic brain injury. This is a topic that is one that I have first hand experience with. Prior to working in the public school system as a special education teacher, I worked with adults with traumatic brain injury in an extended care facility in Massachusetts.
Since being in the position of Learning Disabilities Consultant, I have received either by email or in group discussion questions pertaining to traumatic brain injury, and the most recent one coming from Serena McKenney, in regards to how to teach the essay to a person with TBI. It was then that I decided to have this be this issue's topic. I hope it is helpful to you.

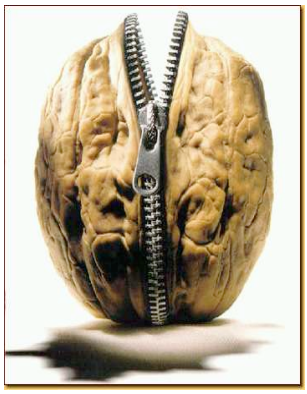


In a Nutshell

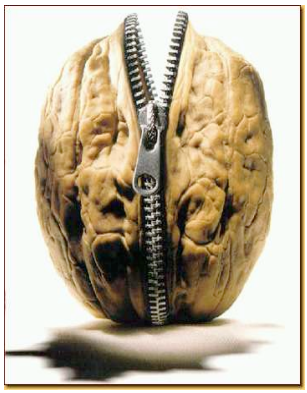
My responsibilities at the Extended Care Facility that I worked at for adults with traumatic Brain Injury (TBI) included reteaching the adults that I worked with everyday living skills that they lost due to their injury with the hope that the skills that they relearned would allow them to rejoin the community.

The residents' injuries that I worked with ran the gamut from strokes and aneurysms, to motorcycle accidents, drug and alcohol abuse, and also attempted suicides.

I began my career at this facility as a behavioral specialist, which required me to use applied behavior analysis and positive reinforcement to primarily reteach social skills and everyday living skills that were lost due to their injury.



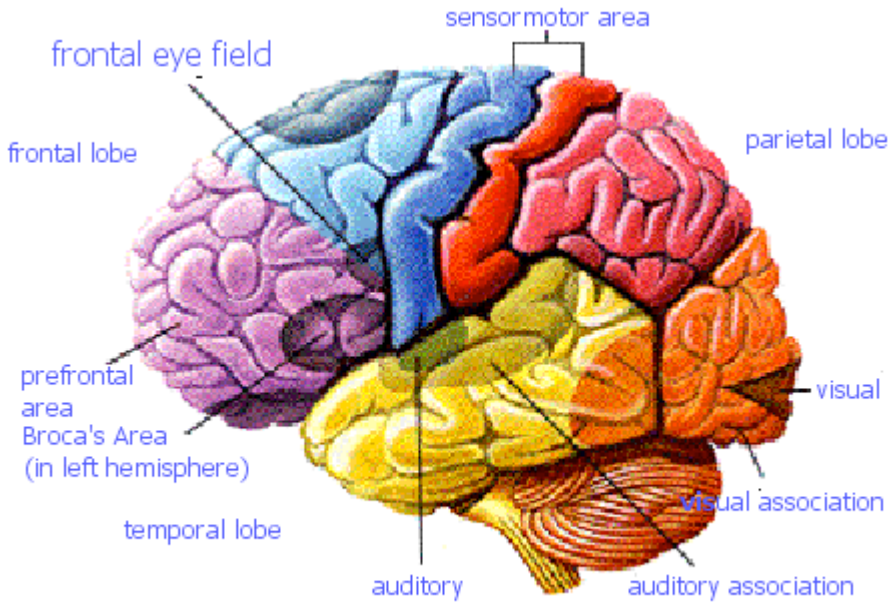
After being at the facility for one year, I got a promotion to Educational Therapist. At this point, I was required to teach them advanced skills that were necessary to assist them in gaining their independence for the community, such as job skills, advanced social skills, money skills, and appropriate communication skills.
With much work, this did become a reality for some of the residents.



What I Learned May Help You

Here are a few strategies that I learned from "on the job training" that is supported by research that might be helpful to you if you have a student with a traumatic brain injury, or for any student that might be a struggling learner, or for one that just likes to learn.

- ✓ Use graphic organizers
- ✓ Use flow charts to connect ideas
- ✓ Chunk information
- ✓ Visualize information
- ✓ Underline main ideas
- ✓ Organize information
- ✓ Develop ideas that the student has
- ✓ Use outlines
- ✓ Record ideas
- ✓ Set specific deadlines
- ✓ Utilize background knowledge
- ✓ Make connections to what they know and like
- ✓ Take small steps
- ✓ Scaffold ideas
- ✓ Ask what they think might help
- ✓ Ask questions for clarity
- ✓ Take your time in teaching and in learning
- ✓ Patience on the side of the student and teacher
- ✓ Reteach material in different ways
- ✓ Realize that on some days the student will "get it" and on some days they won't.
- ✓ Never let them give up on themselves.



Brain Function, It's a Team Sport

The brain is the most complex organ in the body. It is the organ that allows us to think, have emotions, move, and even dream. Given this complexity, it should not be surprising that there are many ways to separate brain parts. Brain parts can be separated on the basis of what they look like to the naked eye, under a microscope, or by what certain brain parts do. The brain and spinal cord make up the central nervous system and all of the nerves found in our body make up the peripheral nervous system. When you see a picture of the brain you probably think of a wrinkled gray blob. Well, the wrinkles are called “cortex” and it is where the majority of brain cells, or neurons, reside. The cortex can be divided into four main lobes. The frontal lobe, where you do your heavy thinking, pondering and planning your actions; temporal cortex, where you process sounds and form memories; occipital cortex, where you process all the things that you see; and parietal cortex, where you integrate or makes sense of all of the different bits of information that are bombarding your brain.

The Hindbrain

Having evolved hundreds of millions of years ago, the Hindbrain or the Reptilian Brain is the oldest part of the human brain. As you might guess from its name, it's a piece of brain anatomy that we share with reptiles and is the most primitive. Likewise it's in charge of our primal instincts and most basic functions. Things like the instincts of survival,

dominance, mating and the basic functions of respiration and heartbeat all come from this area of the brain. Located in the Hindbrain are:

- **The Spinal Cord**

  This is the information superhighway of the body. It carries information up to the brain and instructions back down.

- **The Medulla Oblongata**

  Helps control the body's autonomic functions (things you don't need to think about to perform) like respiration, digestion and heart rate. It also acts as a relay station for nerve signals going to/from the brain

- **The Pons**

  Have roles in your level of arousal, or consciousness, and sleep. Relays sensory information to/from the brain. It is also involved in controlling autonomic body functions.

- **The Cerebellum**

  Mostly deals with movement. It regulates and coordinates movement, posture and balance. It is also involved in learning movement.

The Limbic System

The Limbic System sometimes called the "emotional brain" or "Old Mammalian Brain" is the next brain to have evolved in the more primitive mammals about 150 million years ago. This is where our emotions reside, where memory begins and where these two functions combine together to mark behaviors with positive or negative feelings. It's where mostly unconscious value judgments are made. Information going through the Limbic System is filed under "agreeable or disagreeable". It also plays a role in salience (what grabs your attention), spontaneity and creativity. Located in the Limbic System are:

- **The Amygdala**

  Its name is Latin for almond which relates to its shape. It helps in storing and classifying emotionally charged memories. It plays a large role in producing our emotions, especially fear. It's been found to trigger responses to strong emotion such as sweaty palms, freezing, increased heart-beat/respiration and stress hormone release.

- **The Hippocampus**

This guy is all about memory and a little about learning. Its primary role is in memory formation, classifying information, long-term memory. Like the RAM in your computer it processes and stores new and temporary memory for long term storage. It's also involved in interpreting incoming nerve signals and spatial relationships.

- **The Hypothalamus**

  It should be called the *Hyper*thalamus because it does so much. It's linked closely with the pituitary gland to control many of the body's functions. It monitors and controls your circadian rhythms (your daily sleep/wake cycle), homeostasis (making sure your body is running smoothly), appetite, thirst, other bodily urges and also plays a role in emotions, autonomic functions and motor functions.

- **The Thalamus**

  The Thalamus is THE relay station in the brain. Most of the sensory signals, auditory (sound), Visual, Somatosensory (from your skin and internal organs), go through this organ on their way to other parts of the brain for processing. It also plays a function in motor control.

The Neocortex

The last and most advanced brain to evolve to date is called the Neocortex, neomammalian or rational brain. We share this part of our brain with other higher level mammals like the primates and dolphins, although in humans the neocortex is the largest. It takes up 2/3's of the human brain. This is where we find the brain power to develop language, abstract thought, consciousness and imagination. Let there be no doubt, this is what grants us our status on the food chain and allows us to be human.

The Neocortex is divided into two hemispheres, right and left. The right side of the brain controls the left side of the body and vice versa. Also the hemispheres are divided in terms of what kind of thought they process or produce. The right being more concerned with the artistic, spatial and musical. While the left is more concerned with the colder, linear, rational and verbal aspects. Located in the Neocortex are:

- **The Frontal Lobe**

  This is the most recent evolutionary addition to the brain. If the brain had a White House it would be here. It is the true center for command and control in your body. The Frontal lobe is responsible for functions such as reasoning, problem solving, judgment, impulse control. This coupled with the fact that it's the last to develop when we are young adults, probably answers a lot of questions for many parents out there. It also manages our higher emotions such as empathy and altruism. This lobe is also involved in motor control and memory.

- **The Parietal Lobe**

  The Parietal Lobe is involved in processing pain and touch sensation. It's where the Somatosensory (from your skin and internal organs) Cortex resides. It's also associated with cognition (including calculating location and speed of objects), movement, orientation, recognition and speech.

- **The Temporal Lobe**

  The Temporal Lobe is involved in auditory (sound) sensation and is where the Primary Auditory Cortex and on the left hemisphere, Wernicke's Area (language recognition) are located. This lobe is also involved in emotion, memory and speech.

- **The Occipital Lobe**

  The Occipital Lobe controls visual sensation and processing. The Visual Cortex resides here.

- **Broca's Area**

  This part of the cortex controls speech, language recognition and facial nerves.

- **The Corpus Callosum**

  This is the neural bridge that connects the two hemispheres to each other, located centrally in brain.

http://www.brainhealthandpuzzles.com/brain_parts_function.html

Below you will find research documents that will help clarify what is a traumatic brain injury and how it is defined. The research comes from "Exceptional Child", but it is clear, concise, and accurate to my experience. The articles also point out ways to help students who have traumatic brain injuries.

Traumatic Brain Injury - Definitions

A traumatic brain injury (TBI) is an injury to the brain caused by the head being hit by something or shaken violently. (The exact definition of TBI, according to special education law, is given below.) This injury can change how the person acts, moves, and thinks. A traumatic brain injury

below.) This injury can change how the person acts, moves, and thinks. A traumatic brain injury can also change how a student learns and acts in school. The term TBI is used for head injuries that can cause changes in one or more areas, such as:

- thinking and reasoning,
- understanding words,
- remembering things,
- paying attention,
- solving problems,
- thinking abstractly,
- talking,
- behaving,
- walking and other physical activities,
- seeing and/or hearing, and
- learning.

The term TBI is not used for a person who is born with a brain injury. It also is not used for brain injuries that happen during birth.

IDEA's Definition of TBI

Our nation's special education law, the Individuals with Disabilities Education Act (IDEA) defines traumatic brain injury as...

"...an acquired injury to the brain caused by an external physical force, resulting in total or partial functional disability or psychosocial impairment, or both, that adversely affects a child's educational performance. The term applies to open or closed head injuries resulting in impairments in one or more areas, such as cognition; language; memory; attention; reasoning; abstract thinking; judgment; problem-solving; sensory, perceptual, and motor abilities; psycho-social behavior; physical functions; information processing; and speech. The term does not apply to brain injuries that are congenital or degenerative, or to brain injuries induced by birth trauma." [34 *Code of Federal Regulations* §300.7(c)(12)]

Adapted from information published by the National Information Center for Children and Youth with Disabilities

http://www.teachersandfamilies.com/sped/prof/dis-search2.html

Traumatic Brain Injury - Characteristics

The signs of brain injury can be very different depending on where the brain is injured and how severely. Children with TBI may have one or more difficulties, including:

- Physical disabilities: Individuals with TBI may have problems speaking, seeing, hearing, and using their other senses. They may have headaches and feel tired a lot. They may also have trouble with skills such as writing or drawing. Their muscles may suddenly contract or tighten (this is called spasticity). They may also have seizures. Their balance and walking may also be affected. They may be partly or completely paralyzed on one side of the body, or both sides.

- Difficulties with thinking: Because the brain has been injured, it is common that the person's ability to use the brain changes. For example, children with TBI may have trouble with short-term memory (being able to remember something from one minute to the next, like what the teacher just said). They may also have trouble with their long-term memory (being able to remember information from a while ago, like facts learned last month). People with TBI may have trouble concentrating and only be able to focus their attention for a short time. They may think slowly. They may have trouble talking and listening to others. They may also have difficulty with reading and writing, planning, understanding the order in which events happen (called sequencing), and judgment.

- Social, behavioral, or emotional problems: These difficulties may include sudden changes in mood, anxiety, and depression. Children with TBI may have trouble relating to others. They may be restless and may laugh or cry a lot. They may not have much motivation or much control over their emotions.

A child with TBI may not have all of the above difficulties. Brain injuries can range from mild to severe, and so can the changes that result from the injury. This means that it's hard to predict how an individual will recover from the injury. Early and ongoing help can make a big difference in how the child recovers. This help can include physical or occupational therapy, counseling, and special education.

It's also important to know that, as the child grows and develops, parents and teachers may notice new problems. This is because, as students grow, they are expected to use their brain in new and different ways. The damage to the brain from the earlier injury can make it hard for the student to learn new skills that come with getting older. Sometimes parents and educators may not even realize that the student's difficulty comes from the earlier injury.

Adapted from information published by the National Information Center for Children and Youth with Disabilities

INSTRUCTIONAL STRATEGIES FOR STUDENTS WITH A TRAUMATIC BRAIN INJURY

Though not always visible and sometimes seemingly minor, **brain injury** is complex. It can cause physical, cognitive, social, and vocational changes that affect an individual for a short period of time or permanently. Depending on the extent and location of the **injury**, symptoms caused by a **brain injury** vary widely. Some common results are seizures, loss of balance or coordination, difficulty with speech, limited concentration, memory loss, and loss of organizational and reasoning skills.

Some considerations:

• A traditional intelligence test is not an accurate assessment of cognitive recovery after a **brain injury** and bears little relationship to the mental processes required for everyday functioning. For example, students with **brain** injuries might perform well on brief, structured, artificial tasks but have such significant deficits in learning, memory, and executive functions that they may have difficulty coping.

• Recovery from a **brain injury** can be inconsistent. A student might take one step forward, two back, do nothing for a while, and then unexpectedly make a series of gains. A "plateau" is not evidence that functional improvement has ended.

• Students with acquired **brain** injuries may not be able to predict that they will have difficulty with a task post-**injury** until they have attempted it. Essentially, they have to “re-learn” how they learn.

• Common accommodations for students with **brain** injuries are exam modifications, time extensions, taped lectures, instructions presented in more than one way, alternative ways of completing assignments, early syllabus, notetakers, course substitutions, priority registration, study skills and **strategies** training, and alternative print formats.

Instructional Strategies

Because of the varied and complex manifestations of **traumatic brain injury**, students with **brain** injuries often benefit from instructional **strategies** similar to those listed for other disabilities. The following **strategies** are suggested to enhance the accessibility of course instruction, materials and activities. They are general **strategies** designed to support individualized reasonable accommodations for which a student is eligible, as determined by the Office of Student Life.

• Keep instructions brief and as uncomplicated as possible.

• On request from the student, assist with finding an effective note-taker or lab assistant from the class.

• Allow the student to tape-record lectures.

• Clearly define course requirements, the dates of exams, and when assignments are due; provide advance notice of any changes.

• Provide handouts and visual aids.

• Use more than one way to demonstrate or explain information.

• Have copies of the syllabus ready three to five weeks prior to the beginning of classes so textbooks are available for taping.

• Break information into small steps when **teaching** many new tasks in one lesson (state objectives, review previous lesson, summarize periodically).

• Allow time for clarification of directions and essential information.

• Provide study guides or review sheets for exams.

• Provide alternative ways for the students to do tasks, such as dictations or oral presentations.

• As the semester progresses, verbal reminders in class of impending deadlines (e.g. "Remember, the problem sets are due Friday") are very helpful to students with **traumatic** **brain** injuries.

• Whenever possible, start each lecture with a summary of material to be covered or provide a written outline. Broad margins and triple-spacing on handouts enables students to take notes directly onto the outline, an aid to organization. Provide a review of the major points at the conclusion of each lecture.

• Avoid making assignments orally, since students with **traumatic** **brain** injuries may miss them. Always write assignments on the board or pass them out in written form.

• For large projects or long papers, students with **traumatic** **brain** injuries benefit from assistance with breaking the task down into its component parts and setting deadlines for each part.

• When in doubt about how to assist the student, ask him or her.

• Allow the student the same anonymity as other students (i.e. avoid pointing out

the student or the alternative arrangements to the rest of the class)

This is the html version of the file http://osl.ucsf.edu/dss/assets/brain_injury.pdf