

Brain Injury: A Guide for School Nurses



Brain Injury Association of New Jersey, Inc.



Brain Injury: A Guide for School Nurses

This publication is a project of the Children and Adolescents Committee, formerly known as the Education System Advisory Group of the Brain Injury Association of New Jersey (BIANJ).

Within BIANJ, TBI Outreach Specialists Wendy Berk and Joanna Boyd were the coordinators for this publication with additional assistance provided by specialists Susan Quick, Rita Steindlberger, and Judi Weinberger.

Lead writers:

Susan Cohen, M.S.N., R.N., C.S., Edison School District
Marilyn Kent, M.S.N., R.N., NJ Department of Education
Mary Lotze, P.N.P., M.S., Robert Wood Johnson Medical School, UMDNJ
Judith Woop, M.Ed., R.N., NJ State School Nurses Association

Other group contributors included:

Jill Brooks, Ph.D., Robert Wood Johnson Medical School, UMDNJ
Jill Harris, Ph.D., Children's Specialized Hospital
Bonnie Merkel, M.A., NJ Department of Education
Lois Mishkin, M.A., C.C.C./L.D.T.C., Lois Mishkin Associates, Inc.
Susan Paradise, M.Ed., JFK Rehabilitation Institute
Brad Ross, Ph.D., Children's Specialized Hospital
Ron Savage, Ed.D., Bancroft NeuroHealth
Sue Stephens, M.S.W., Children's Specialized Hospital

Edited by:

Marilyn Lash, M.S.W.

The printing of this guide is made possible through the New Jersey Traumatic Brain Injury Fund, administered by the New Jersey Department of Human Services, Division of Disability Services.

Revised March 2008

This publication is not copyrighted and may be reproduced and distributed in any form. For further information about this publication, or to obtain additional copies, please contact:

Brain Injury Association of New Jersey, Inc. (BIANJ)

825 Georges Road • 2nd Floor • North Brunswick, NJ 08902

Phone: 732-745-0200 Fax: 732-745-0211 Email: info@bianj.org Web: www.bianj.org

FAMILY HELPLINE: (800) 669-4323

President & CEO: Barbara Geiger-Parker

Table of Contents

Introduction.....	1
Brain Injury Association of New Jersey.....	2
Chapter 1 What is Brain Injury?.....	3
The silent epidemic.....	4
Mild brain injury.....	5
Chapter 2 Statistics.....	7
Some national figures.....	7
Some NJ statistics.....	7
Chapter 3 Brain Structure and Function.....	8
Brain stem.....	8
Cerebellum.....	8
Cerebral hemispheres.....	8
Lobes.....	8
Corpus callosum.....	8
Chapter 4 What Happens to the Brain When It Is Injured?.....	10
Primary effects.....	10
Secondary effects.....	10
Defining the severity of traumatic brain injury.....	10
Rating Scales.....	11
Chapter 5 Common Changes Following a Brain Injury.....	12
Physical changes.....	12
Cognitive changes.....	12
Psychosocial changes.....	13
Neuropsychological evaluation.....	14
Chapter 6 Pharmacological Intervention.....	15
Antidepressants.....	15
Anticonvulsants/mood stabilizers.....	15
Psychostimulants.....	16
Chapter 7 School Re-entry.....	18
Academic and cognitive considerations.....	18
Home instruction.....	18
Cognitive rehabilitation.....	18
Educational placement.....	19
Chapter 8 Transitional Planning.....	21
Preparing school staff.....	22
Preparing peers.....	22
Preparing the family.....	23
Preparing the student with a brain injury.....	23
Special considerations for adolescents and older students.....	23

Chapter 9 Role of the School Nurse.....25
Advocate.....25
Prevention.....25
Coordinate.....26
Educate.....26

Chapter 10 Personal Stories.....28
Katie’s mild brain injury.....28
Kevin’s moderate brain injury.....30
Eric’s severe brain injury.....32

Concussion in Sports Consensus Statement.....34
Glasgow Coma Scale.....36
Rancho Los Amigos Scale.....37
Individualized Healthcare Plan.....38
References.....40
Glossary of Medical and Rehabilitation Terms.....41
Glossary of Educational Terms.....50
Statistics.....52
Resources.....53
BIANJ Publications.....55
Books & Videos.....56
Please Give us your Feedback.....58
Order Form.....60

Introduction

Members of the Children and Adolescents Committee (formerly known as the Education System Advisory Group) of the Brain Injury Association of New Jersey (BIANJ) wrote this guide to:

- provide school nurses with information about brain injury as it relates to a child's education and health needs, and
- encourage support from school nurses to help raise awareness about brain injury and its prevention.

The writers and members of the Brain Injury Association of New Jersey's Children and Adolescents Committee include family members of children with brain injuries, school nurses, and professionals who work in the fields of cognitive rehabilitation, general and special education.

This guide was specially written for school nurses because of your crucial role in the lives of students. It provides an overview of information that may be helpful while working with students affected by brain injury. It will familiarize you with the needs and circumstances of these students. The guide focuses on the needs of students with brain injuries that have been diagnosed as moderate to severe by a medical professional. In addition, the needs of students with mild brain injuries are addressed. Students with mild traumatic brain injuries can exhibit some of the same characteristics as those with moderate traumatic brain injuries, even though the diagnosis is not evident immediately or may be noted as a concussion in the student's medical history.

Brain injury affects each student differently. It is impossible to cover all aspects of how a brain injury can affect a student's experiences, abilities and needs in school. There are references and resources at the end of this guide for additional information.

"Weighing less than sixteen hundred grams (three pounds) the human brain in its natural state resembles nothing so much as a soft, wrinkled walnut. Yet despite this inauspicious appearance, the human brain can store more information than all the libraries in the world. It is also responsible for our most primitive urges, our loftiest ideals, the way we think, even the reason why, on some occasions, we sometimes don't think, but act instead."

The Brain by Richard Restak, M.D.

The **Brain Injury Association of New Jersey** (BIANJ) is a statewide membership organization dedicated to providing education, outreach, prevention, advocacy, and support services to all persons affected by brain injury, as well as to the general public. The BIANJ has committed its resources to a set of goals to provide services and programs urgently needed now and in the future. The current programs and services offered by BIANJ are:

- Information and resource service
- Support groups for persons with brain injuries and their families
- A week-long summer respite and recreation program
- A supported employment demonstration project
- Initiatives to help prevent brain injuries
- Education about brain injury for educators, health care staff, human services personnel, and people affected by brain injury
- Advocacy and legislative action
- Care coordination services for individuals who sustain brain injuries and their families
- Outreach to provide information about brain injury and resources in languages other than English and in alternate formats

BIANJ can provide information about professionals who are available to speak to school personnel about brain injury. They also have manuals that have been specially written for educators and families about the impact of a brain injury on the education of children.



825 Georges Road • 2nd Floor • North Brunswick, NJ 08902
Phone: 732-745-0200 Fax: 732-745-0211 Email: info@bianj.org Web: www.bianj.org

Chapter 1

What is Brain Injury?

The definition of brain injury has changed over the past 10 years. Brain injuries are described as traumatic or acquired based on causes of the injuries. Knowing what causes brain injury is very important for researching effective treatments and developing prevention programs.

According to the definition developed by the Brain Injury Association of America (BIAA), a “*Traumatic Brain Injury (TBI) is an insult to the brain, not of a degenerative or congenital nature, which is caused by an external physical force that may produce a diminished or altered state of consciousness, and which results in an impairment of cognitive abilities or physical functioning. It can also result in the disturbance of behavioral or emotional functioning.*”

Traumatic brain injuries happen during everyday activities. The most common causes in young children are falls, such as a fall from a changing table or falling down the stairs in a walker. Car crashes, pedestrian accidents, as well as physical abuse from hitting or shaking a child, are also major causes of brain injury. Skate boarding, roller blading, falling off a bike or scooter, falling from a slide, and sports injuries are common causes in older children.

Acquired brain injury (ABI) is an injury to the brain which is not hereditary, congenital or degenerative.

Acquired brain injuries are caused by certain medical conditions, such as stroke, encephalitis, aneurysm, anoxia (during surgery, drug overdose, or near drowning), metabolic disorders, meningitis, or brain tumors.

Although the causes of insults to the brain may be quite different from each other, the effects of these injuries on a child’s life are quite similar.

This guide generally refers to students with traumatic and acquired brain injuries as students with a brain injury. The term “traumatic brain injury” is used throughout the text when information provided is specific to traumatic injuries.

Some students with traumatic brain injuries are classified as eligible for special education and related services based on the criteria for TBI. However, within the special education system in New Jersey, students with brain injuries are most likely categorized under some other handicapping condition that also qualifies them for special services under IDEA or Section 504. This is because the descriptive category of TBI was only added a few years ago. Prior to this addition, a student with a brain injury was generally classified as NI (neurologically impaired), MH (multiply handicapped), or some other category. Obtaining an accurate census of students with brain injuries is a challenge that is only now being addressed by professionals in the field. Part of the challenge is inherent in the issue of how brain injury is defined. The New Jersey Special Education Code reads:

“Traumatic brain injury” corresponds to “neurologically impaired” and means an acquired injury to the brain caused by an external physical force or insult to the brain, resulting in total or partial functional disability or psychosocial impairment, or both. 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; problemsolving; sensory, perceptual and motor abilities; psychosocial behavior; physical functions; information processing; and speech.

The NJ definition replaces *neurologically impaired* with *traumatic brain injury*, but in doing so excludes students with acquired brain injury from this category. The lack of good statistical information about children and brain injury is not unique to the New Jersey Department of Education.

The Center for Health Statistics of the N.J. Department of Health and Senior Services reports that there were more than 2,000 children who sustained traumatic brain injuries resulting in hospitalization in 2000, the last year for which complete data are available. These numbers do not include children with acquired brain injuries or children who were only seen in emergency rooms, clinics, doctors' offices, or not at all. These figures, and those available from pediatric rehabilitation hospitals that specialize in brain injury rehabilitation, tell us that thousands of children with brain injuries severe enough to require lengthy in-patient rehabilitation are hidden among the population of students receiving special education services.

These numbers do not reflect the thousands of additional students with "mild" brain injuries who never received rehabilitation or other medical intervention. Establishing an accurate census for TBI within the educational system requires that any student who meets the criteria for TBI be classified accordingly, and not under an alternate category.

It is likely that most educational systems will encounter students with brain injuries. The many possible causes of brain injuries include:

- traumatic brain injury (TBI)
- cerebral vascular accidents (CVA)
- brain tumors
- seizure disorders
- anoxic events such as near drowning and smoke inhalation
- infectious diseases such as Lyme Disease and encephalitis
- metabolic disorders
- toxic effects from substances such as lead or other heavy metal poisoning
- effects of childhood cancers requiring chemotherapy and radiation.

In the past, individuals with brain injuries often did not survive. The advent of new medical technologies has greatly increased survival rates. Increasingly, children with brain injuries return home and go to school. The ability of educators and other professionals to identify, assess and educate these students has a critical impact upon their lives. An increased understanding of their needs will lead to improvements in academic, emotional and social functioning. The role of the school nurse is crucial to this process.

The silent epidemic

Brain injury is called the "silent epidemic" because of the staggering number of people who are injured each year. As many as 1.4 million people in the United States have traumatic brain injuries each year, but only one sixth of them are admitted to hospitals. This does not even count people with acquired brain injuries.

This epidemic is the leading cause of death and disability in children and young adults. The majority of children who have mild or even moderate brain injuries may not be hospitalized. Symptoms from a mild brain injury may not be apparent immediately after the injury. Academic and/or behavioral problems can emerge later and not be identified as resulting from the earlier brain injury. This means that many children and their families are not aware that special attention is needed. Family members, school personnel, and even medical professionals often have trouble figuring out why a child's behavior or abilities have changed when symptoms finally appear.

Medical technology has advanced so greatly in the past twenty years that many people with brain injury, who

formerly would have died, are now saved. Rehabilitation programs used to be primarily for restoring physical functioning – helping people walk and talk again. The increase in the number of “survivors” of brain injury has led to new and specialized treatment in hospitals and rehabilitation programs, as well as services in the community. They are all part of the road to recovery after brain injury.

Brain injury is also “silent” because most children with brain injuries look “normal”. Difficulties caused by the injury may not become apparent for months or years after the injury. As a child tries to learn new and more complex information in school, or make complicated and important moral decisions, difficulties can appear over time.

Mild brain injury

A child with a mild brain injury, often described as a concussion, may not have lost consciousness. Children are less likely to lose consciousness from a brain injury than an adult. As a result, the injury often goes unnoticed or is not diagnosed. A few days or months later, there are some changes in the child’s behavior. The child gets frustrated easily, has trouble sticking to tasks and gets distracted, or grades drop. More problems result from the child’s inability to understand these difficulties. A child may have trouble getting along with other children and become aggressive or depressed. These behaviors can worsen when family, educators and friends do not understand these changes and do not know what to do.

Common causes of mild brain injury are:

- falls off bikes, swings, or skateboards
- collisions during soccer, football or baseball
- throwing or swinging a young baby
- whiplash injuries in a motor vehicle crash

A mild brain injury usually results in a temporary change in the way the brain works. There may be a short loss of consciousness, but often there is no loss of consciousness. Rather, a child may feel confused, groggy or disoriented for a while. For example, a child may not remember what was happening just before the injury. This confusion usually lasts less than an hour.

Some of the common residual symptoms or after effects include:

- headaches
- tinnitus or ringing in the ear
- slower processing of information or slow thinking
- trouble understanding written and spoken information
- distractibility or jumping from one thing to another
- difficulty changing from one activity to another
- sensitivity to lights and/or sounds

A child may have one or more of these symptoms or show other changes not on this list. It can take anywhere from three months to a year for these symptoms or changes to go away. In a small percentage of children, symptoms continue for a long time and have serious effects at home and in school.

Many times, a child with a mild brain injury appears to be fine until problems show up in school. Grades drop for no apparent reason. Often, doctors are unable to find anything physically wrong, because mild brain injury is difficult to detect. There are usually no findings on a CT Scan or MRI to explain the symptoms. This is why education about mild brain injury is so important for the child, family and school staff.

The same student has been in your office every day this week with complaints of feeling dizzy and having headaches. The teacher has been in to see you about this student because he has not been “himself” in class. You have called the parents and explained what has been going on in school. They don’t have any explanation for the student’s change in behavior - until you ask the right question. “Has your child taken any falls lately, maybe when biking or roller blading?” Suddenly, the parent remembers the fall the student took when roller blading and the bump on the head. The child was shaken up, but seemed okay and went back to playing. Could there be a connection - maybe?

The school nurse can help by getting information about mild brain injury from BIANJ and by working closely with school staff and the family to put together a plan to help the student adjust to these changes. For example, the child may need shorter homework assignments or extra time on a test. Support and information can help family, teachers, and the student develop skills to manage any physical, cognitive, social or emotional changes at home and school. They can also prevent or minimize behavioral difficulties such as depression, temper tantrums, or acting out.

Symptoms after a mild brain injury usually go away within 3-6 months; however, 3-6 months of a school year can span 2-3 marking periods. This can have devastating effects on a student’s ability to develop the knowledge base for the entire school year. There may be rippling effects over the next year.

Education about this condition and close contact with family and school staff are important for ANY student with a mild brain injury. They can reduce difficulties and failure in school and help avoid negative behavioral, emotional and academic consequences.

Chapter 2

Statistics

Some national figures

According to the Centers for Disease Control and Prevention (CDC), a conservative estimate puts the total number of traumatic brain injuries at over 1.4 million annually in the United States. This is equivalent to close to 4,000 individuals sustaining a TBI daily.

The Centers for Disease Control and Prevention (CDC) estimate that 5.3 million Americans, a little more than 2% of the US population, currently live with disabilities resulting from traumatic brain injuries. Brain injury occurs every 21 seconds and sends more than one million individuals to the hospital each year. The rates for TBI are highest for adolescents and young adults, children under the age of 5, and people over the age of 75.

Some NJ statistics

The Center for Health Statistics in New Jersey compiles traumatic brain injury statistics for the state by using data from hospital admission records. Persons with mild brain injury who were observed in an emergency department and released, as well as those who never sought help at all, are not included. Consequently, the data for traumatic brain injury are under estimated. According to this limited data, there were over 2,000 non-fatal traumatic brain injuries, ages 0 to 21, in 2000.

Cost

The cost of traumatic brain injury among children is significant in New Jersey. In 1997, acute care hospital costs alone were in excess of 30 million dollars for children who were admitted with the diagnosis of traumatic brain injury. Not included in this figure are the considerable costs for medical and all other follow-up care after release from the acute care setting, plus post-injury costs for all those children who were never hospitalized. These medical costs can include, but are not limited to, physical and neurocognitive rehabilitation, and special education services.

Gender

Gender differences in New Jersey are similar to the national statistics with males sustaining more brain injuries than females. This higher incidence of traumatic brain injury in males is seen regardless of cause. The ratio increases further when traumatic brain injury from assaults is examined, with 90% of brain injuries from assault occurring in males.

Additional national and NJ statistics can be found at the end of this Guide.

Chapter 3

Brain Structure and Function

A review of the anatomy and physiology of the brain illustrates the importance of the diagnosis and site of injury. School nurses can use this information to educate others about the consequences of a brain injury and how it may affect the student.

The skull completely encloses and protects the brain. Several layers of tissue cushion the brain and protect it. Cerebrospinal fluid surrounds the brain and fills the ventricles (hollow areas within the brain). The brain has several major divisions: the brain stem, cerebellum, and two cerebral hemispheres.

Brain stem

The brain stem controls:

- respiration
- cardiovascular functions
- gastrointestinal function.

The brain stem also contains cranial nerves, which control the sensation and movement of the tongue, eyes, ears, face, and mouth, as well as swallowing functions.

Cerebellum

The cerebellum:

- controls motor coordination
- monitors muscle tone and equilibrium.

Cerebral hemispheres

Although the two cerebral hemispheres look like mirror images of each other, they have different functions. Each hemisphere controls motor and sensory function for the opposite side of the body. In addition, both hemispheres specialize in certain faculties:

- Left hemisphere directs language functions.
- Right hemisphere manages visual spatial skills.

Lobes

Each hemisphere is divided into four lobes:

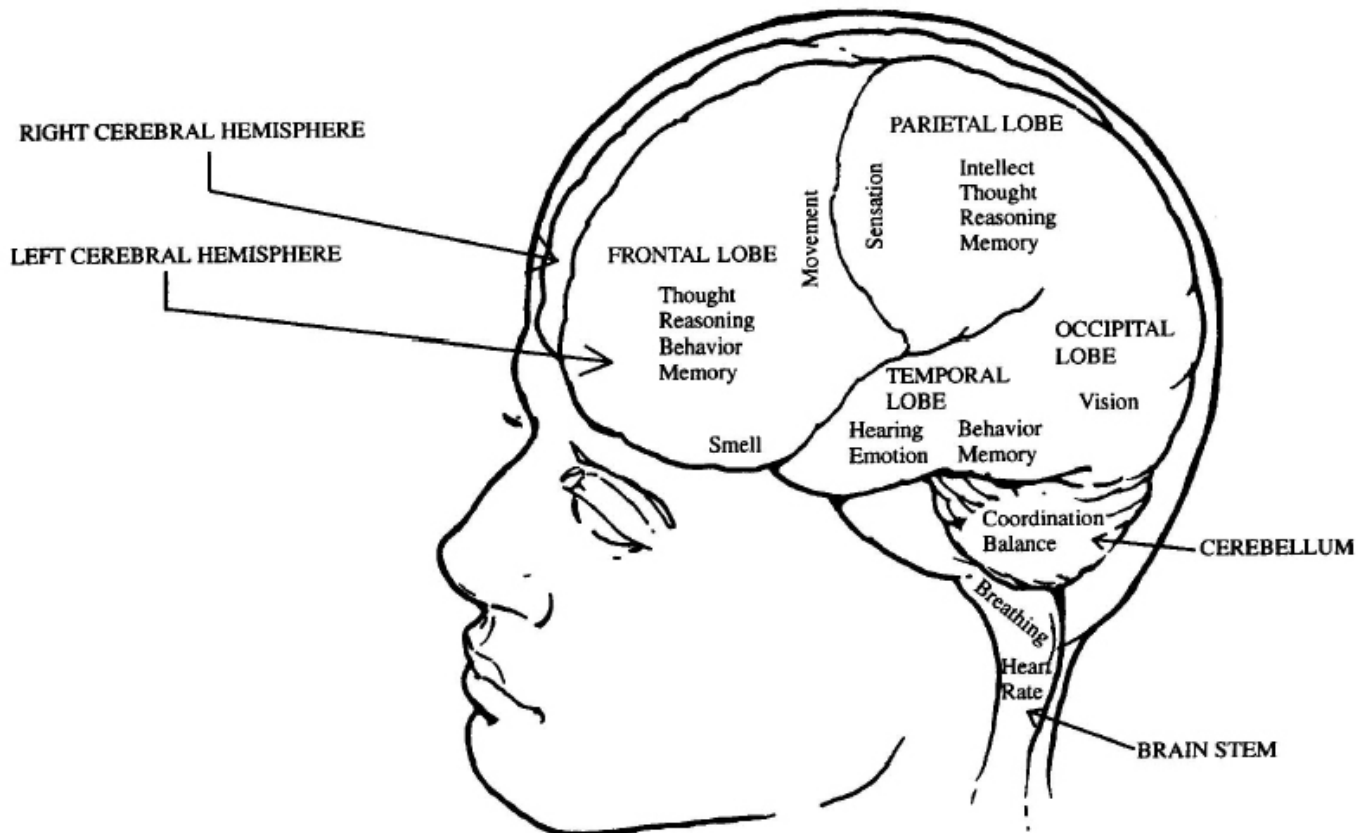
- frontal
- temporal
- occipital
- parietal

Corpus callosum

The two hemispheres connect and transfer information back and forth via the corpus callosum.

Although certain parts of the brain are primarily responsible for certain functions and behaviors, all parts work together to allow a person to function. The following chart describes regions of the brain and corresponding Cognitive, Behavioral and Motor Functioning

<u>Region</u>	<u>Functions</u>
Brain Stem	Autonomic body functions
Cerebellum	Coordination and memory for over learned motor tasks
Mid Brain	Transfer of information between brain regions, movement, basic drives including arousal, motivation, growth, hunger, thirst, emotional reaction, aggression, and sexual response
Posterior	Receptive abilities
Anterior	Expressive abilities
Left hemisphere	Verbal abilities, sequential reasoning, detail problem solving
Right hemisphere	Visual spatial abilities, understanding the big picture
Occipital	Visual disturbances
Parietal	Visual - spatial, sensory perception, awareness of deficits
Temporal	Auditory perception, memory and learning, receptive language and receptive nonverbal auditory input, behavior
Frontal	Expression, attention, organization, planning, cognitive flexibility, the ability to profit from feedback, and regulation of behavior



This diagram reprinted with permission from *Acute Brain Injury: A Guide for Family and Friends*, The University of Iowa 2000

Chapter 4

What Happens to the Brain When It Is Injured?

Permanent tissue damage often results as the soft brain tissue moves against the skull. This can occur either when the head strikes an object directly or when the head is jolted about without direct impact.

Primary effects

When there is a blow to the skull or a sudden acceleration and deceleration movement, several things may happen. The brain can literally move around inside the skull, slam against the sides of the skull and bounce back and forth.

A *coup injury* is caused by the impact where the blow occurs or the head strikes.

(For example, when the head hits the windshield during a car crash, the brain moves forward and the frontal lobes may be injured.)

A *contrecoup injury* is the result of further damage as the brain rebounds and collides with the side of the skull that is opposite the initial site of impact (the coup).

(For example, after it moves forward, the brain bounces back and hits the back of the skull.)

Acceleration/deceleration are the rapid movements of the brain forward and backward. For example, this can happen during a car crash, during a bicycle fall when the head hits the ground, or when a baby is shaken.

Shearing/rotation occurs as the twisting and rotation of the brain damages blood vessels and nerve fibers. Permanent diffuse damage may result from even a mild injury.

Secondary effects

Secondary effects occur after the initial injury and can complicate the severity of the brain injury. The most common secondary effect is increased intracranial pressure. This causes more blood to build in the vessels and can result in tissue death. Surgery is required to remove the subsequent hematoma or blood build-up.

Defining the severity of traumatic brain injury

Traumatic brain injuries are characterized as *mild* (or *concussion*), *moderate* and *severe*. Although definitions vary among hospitals and physicians, the following guidelines can help you understand these terms when they are included in medical reports.

Mild (or concussion)

- Brief (<1 hour) or no loss of consciousness (LOC)
- Possible symptoms of a concussion

Moderate

- Coma more than 1 hour but less than 24 hours
- Neurological evaluation finds evidence of brain trauma
- Possible positive findings on CT scan or EEG

Severe

- Coma > 24 hours

Rating scales

Two scales are commonly used to assess a patient's responses and functioning levels after a brain injury. They are typically used to assess traumatic brain injury but have been used with acquired brain injuries as well. Both are widely used and referred to in many reports.

Glasgow Coma Scale

The Glasgow Coma Scale assesses the level of consciousness after a brain injury. It rates the patient by eye, motor, and verbal responses to commands. Scores range from 1 to 15. Individuals with scores of 9 or above are not considered to be in a coma state. This scale is also used to determine changes in the patient's status during the acute phase. The complete scale is included in the Appendix. There is one scale for children below age 4 years and another for those over 4 years.

Rancho Los Amigos Scale of Cognitive Functioning

This scale is used during the rehabilitation stage to categorize recovery of cognition and behavior. This scale is valuable in planning treatment programs and measuring progress. The Rancho Los Amigos Scale is included in the Appendix.

Chapter 5

Common Changes Following a Brain Injury

Although each brain injury is unique, there are common changes or complaints that are reported by most students. These changes often are not explained by pathology. A CT or MRI scan only reveals severe damage. Mild or moderate brain injuries may not have any pathological support. Neuropsychological testing, clinical observation, and personal complaints provide information about how the brain injury affects a student.

Physical, cognitive and psychosocial changes are most common among students with brain injuries. The degree of change or severity varies depending on the damage to specific nerve cells.

Physical changes

Physical changes can be as obvious as paralysis or as vague as a specific field cut.

Physical changes may include:

- difficulty walking, problems with gait
- trouble with balance, falling or bumping into things
- dizziness
- poor muscle coordination, spasticity
- unilateral or bilateral weakness or paralysis
- difficulty grasping objects
- vision disturbances, blurred or double vision, light sensitivity, field cuts
- hearing disturbances, tinnitus (ringing in the ears), noise sensitivity, hearing loss
- problems with speech and motor control, slurred speech
- headaches
- nausea
- increased fatigue
- seizures

Cognitive changes

A student with a brain injury typically has a variety of cognitive difficulties that pose special challenges in school. Even a student with a mild brain injury, who did not lose consciousness and had negative findings on an EEG or CT scan, may have cognitive difficulties that affect learning.

Just because a student looks fine, does not mean that the brain injury has not affected the processes of thinking and learning.

Some cognitive changes that commonly occur after a brain injury are *difficulties with*:

- short and/or long term memory loss
- lowered concentration; easily distracted; hard time staying on task
- doing two things at once
- following directions, gets confused
- understanding what is going on
- problem solving and abstract thinking

- organization
- word retrieval
- ability to do things sometimes, but not other times
- social judgement
- sequencing
- decision making
- goal setting
- self monitoring
- initiating tasks
- shifting topics
- forming opinions or beliefs
- processing environmental cues
- planning
- generalizing information
- generalizing ideas
- pace for processing of information, takes longer

Psychosocial changes

Psychosocial changes can result from:

- primary neurophysical damage
- preexisting disposition to emotional difficulties
- cognitive deficits which lead to psychosocial changes

Examples

A student's poor recall results in lowered test performance and this leads to inappropriate behavior.

Psychological trauma over the injury leads to student's loss of family or friends and causes social isolation and depression.

Lowered IQ scores and intellectual abilities lead to student's lowered self-esteem and sense of failure.

Organic changes from a brain injury can cause serious changes in behavior. These may present the greatest challenges for a student. Behavior and personality changes are also common in students with mild brain injuries. Behaviors like impulsivity, explosive verbal or physical outbursts, irritability, inappropriate crying or laughing, and other increased inappropriate responses are typical following a brain injury.

Depression and anxiety over losses and functional changes are frequent effects. They can make the classroom and social environments even more difficult for the student. Any preexisting disposition to emotional difficulties is usually exacerbated by the brain injury. This can be further complicated by decreased understanding about what is an appropriate emotional or behavioral response to a given situation.

Decreased social functioning and subsequent loss of friends can be major contributors to increased anger. A brain injury often affects the student's ability to process social cues. The speed and fluency of speech may be affected, making it harder for the student to maintain conversations using appropriate vocabulary and social judgment.

Some students with brain injuries have difficulty not only with learning and remembering, but also with applying social rules that fit the situation. Consequently, they are often rejected by students, teachers, and family members who do not understand their behaviors. It is important that everyone in the student's environment be properly educated about the impact of the brain injury and how best to help.

Typical psychosocial changes may include

- irritability
- mood swings
- impulsivity, acting without thinking
- difficulty accepting someone else's point of view
- sadness, low energy
- low self-esteem
- fidgety behavior or restlessness
- agitation
- hostility
- disinhibition
- sexual disinhibition
- explosive verbal or physical outbursts
- depression
- anxiety

Neuropsychological evaluation

A neuropsychological evaluation provides the best assessment of cognitive changes following a brain injury. A neuropsychologist is a psychologist with postdoctoral training and specific expertise in developmental neuropsychology. This is the study of how behavior and thinking develop and change as the brain matures over time. Although most school systems do not have a neuropsychologist on staff, school systems are required by law to provide all necessary evaluations and services to promote a student's optimal learning.

It is important for a student with a brain injury to have a neuropsychological evaluation one or more times during the course of recovery. This evaluation gives a comprehensive assessment of a student's thinking skills (cognition), behavior, and emotional status. The testing takes between six and twelve hours to complete. This evaluation provides information about how the student learns and identifies strengths and weaknesses. The evaluation yields information that is critical for developing an effective educational program.

The neuropsychological evaluation identifies areas where help is needed. For example, family and teachers may help a student with very short attention learn how to recognize when distracted and how to get back on task. A student with poor short-term memory might learn to use a daily checklist or log to help with recall. A cognitive rehabilitation program may be recommended to help the student develop compensatory strategies in order to process and use information more effectively.

Chapter 6

Pharmacological Intervention

Over the past several decades, there has been a better understanding in the acute mechanisms of brain injury as well as the recovery of a brain injury survivor. Recently, interest has grown in the potential positive and negative roles pharmaceuticals can play in the recovery process as well as in the treatment and rehabilitation of students with brain injuries. Medications used to treat brain injury either facilitate or inhibit specific neurotransmitter activity. Pharmacological intervention can alleviate specific symptoms, improve function, and even enhance the cortical recovery process.

The clinical characteristics of several student groups resemble those of students with brain injuries. For example, principles of pharmacological treatment for hyperactivity and learning disabilities are relevant to treatment for brain injury. To a large extent, the same drugs are prescribed and the same measures are used to evaluate the efficacy of treatment. As noted earlier, even mild brain injuries can lead to impairments requiring pharmacological intervention.

The clinical indication for a specific drug may vary. The possible treatments for a specific disorder may include drugs from more than one drug class. A specific drug may be used to treat a wide variety of disorders.

Antidepressants

Antidepressant medications are frequently used to treat depression, pain, and sleep disturbances. Most of the anti-depressant effects of the medications can be attributed to effects on acetylcholine, noradrenaline or serotonin. Selective serotonin reuptake inhibitors (SSRI) have become widely used in recent years. The most commonly used SSRIs are:

- fluoxetine (Prozac)
- paroxetine (Paxil)
- sertraline (Zoloft)
- fluvoxamine (Luvox)
- citalopram (Celexa)

Tricyclic antidepressants have been used in chronic pain syndromes and post traumatic injuries. Due to their inherent anticholinergic activity, they tend to produce sedation as well as lowering the seizure threshold. The most useful tricyclic antidepressants are:

- amitriptyline (Elavil)
- desipramine (Norpramin)
- imipramine (Tofranil)

Serotonergic agents are utilized in the treatment of various disorders, including anxiety, depression, pain, sleep disorders. The most commonly used serotonergic agent in brain injury patients is:

- trazadone (Desyrel)

Anticonvulsants/mood stabilizers

Anticonvulsants/mood stabilizers are prescribed for affective disorders, neuralgia, aggression, hyperactivity, as well as seizure disorders. These drugs include:

- carbamazepine (Tegretol)
- valproic acid (Depakote)

- phenobarbitol
- phenytoin (Dilantin)
- gabapentin (Neurontin)
- lamotrigine (Lamictal)
- topiramate (Topamax)

Although developed for the control of seizures, carbamazepine and valproic acid are commonly prescribed as mood stabilizers. These medications have clinical benefit in reducing emotional lability, especially angry outbursts, post-traumatic agitation.

These medications are also prescribed following the onset of seizures, or even on a prophylactic basis, following a traumatic brain injury. Post-traumatic seizures are categorized as immediate – within the first 24 hours, early – during the first week or late – occurring after first week of injury. The incidence of posttraumatic epilepsy is low (2-5%); lower in persons with closed head injuries and higher in persons with penetrating wounds or intracranial hematomas.

A seizure or two immediately following a traumatic injury does not necessarily indicate the need for ongoing anticonvulsant treatment. The longstanding practice of using anticonvulsant medications on a prophylactic basis has been questioned by recent research studies. Nevertheless, a number of students with brain injuries return to school on maintenance doses of anticonvulsants. These medications may be continued inadvertently for months or even years following brain injury. Such treatment is of questionable benefit and may also contribute to a student's depression, memory problems, and motor coordination difficulties.

The student on anti-epileptic medication should be monitored for side effects and toxicity as well as potential drug interactions when other new medications are prescribed. The school nurse can help by assessing the potential impact of medications upon a student's performance in school. The school nurse can also talk with parents about the value of further consultation with the student's physician about the medication regime.

Psychostimulants

This class of medication can improve symptoms of inattention, distractibility, disorganization, hyperactivity, impulsiveness, long-term memory difficulties and emotional lability. Positive effects from this class of medication are apparent within days or hours after an optimal dose is achieved. Stimulants have the advantage of being “yes-no” drugs; they either work or they do not. When they do work, positive effects are readily apparent.

Stimulants are currently recommended for students with brain injuries who have prominent symptoms of:

- Attention deficit/hyperactivity
- Anergia/apathy
- Deficits of initiation
- Frontal lobe syndrome

Commonly prescribed psychostimulants include:

- methylphenidate (Ritalin, Concerta)
- dexedrine (Dexedrine)
- dextroamphetamine (Adderall)

Although stimulant treatment can be stopped abruptly in students with ADHD, with no withdrawal symptoms even after years of treatment, students with brain injuries seem different. Abrupt discontinuation in students with brain injuries may lead to severe withdrawal reactions, with symptoms of depression, anergia (loss of energy), or agitation.

The field of neuropharmacology for survivors of brain injuries is relatively young. Many medication trials are ongoing in acute care and rehabilitation settings caring for patients with brain injury. Certainly new medications will be found to be effective with survivors of brain injuries. Since these students exhibit such a wide range of cognitive and behavioral deficits, it is important for the school nurse to keep abreast of changes and new research in this field.

The school nurse should maintain accurate medication records and note changes in dosage and possible side effects and impact on school performance. Dosages may need to be adjusted or the drug discontinued as per physician's orders.

Who may dispense medication?

Medications may be dispensed only by a licensed professional in accordance with the New Jersey Nurse Practice Act (NJSA 45:11).

Resource:

Rehabilitation of the Adult and Child with Traumatic Brain Injury, Third Edition by Rosenthal et al.

Chapter 7

School Re-Entry

It is important that a number of issues be considered prior to a student's return to school. Instructional modifications, scheduling and general "logistical" concerns are critical and often require careful planning. The return to school must be managed carefully to avoid frustration and failure for the student, family and school.

Academic and cognitive considerations

Parents and professionals must decide when and how a child with a brain injury will return to school.

Considerations include:

- health stability
- energy level
- attention/concentration
- memory changes
- organizational weaknesses
- ability to handle stimuli of a small group or classroom.

Deficits in any of these areas may affect the student's ability to learn new material and result in academic failure. A period of home instruction and/or cognitive rehabilitation may be recommended prior to school re-entry.

Home instruction

Home instruction for students with brain injury can begin during the hospital stay once medical issues have been stabilized and the student's energy level allows for cognitive work. The student's tolerance needs to be monitored so that the time allowed for instruction (typically five hours per week for students who have not yet been found eligible for special education and related services) can be best utilized. This is a good time to begin the process of eligibility determination. Even if the student is not ready for formal school re-entry, once found eligible, the maximum ten hours per week of home instruction can begin.

A student with a brain injury often returns to school part-time with a gradual increase in time until a full-time schedule can be maintained with appropriate services. Given this part-time schedule, a home instructor may be one of the educators providing cognitive/academic teaching. Including the home instructor in meetings with others on the educational team will enhance understanding of the needs of the student, the impact of the brain injury, strengths and weaknesses, and necessary strategies so that instruction is appropriate. With proper preparation, the home instructor can become the person who communicates with other school personnel about processing issues, learning needs and effective strategies.

Cognitive rehabilitation

Cognitive rehabilitation focuses on retraining the neurological processes that were affected by the injury. These "thinking skills" are required for a person to function and succeed. When some of these skills are affected in a student, it is likely that learning will be different and less efficient than prior to the injury. Cognitive therapists help the student develop strategies to compensate for skills that may be diminished for a period of time during recovery or even long term. An example is a student whose ability to problem solve is affected. This student may have difficulty identifying a problem, determining solutions for the problem, and/or carrying out the

solutions. The cognitive therapist helps the student develop strategies necessary for effective problem solving to take place.

A student can receive cognitive rehabilitation in conjunction with home instruction or a school placement. Skills developed during cognitive rehabilitation can be shared with school staff. Likewise, cognitive techniques and strategies developed in school need to be shared with the cognitive therapist. Benefits of cognitive rehabilitation are maximized when the student, school staff and cognitive therapist work together, share information, and implement the same strategies in school, during therapy and at home.

Educational placement

There are many questions to consider for school placement when a student has a brain injury. Often, the school nurse is a key resource if the student has a severe injury with medical complications. Home instruction in the rehabilitation facility or at home is generally a short-term solution until an appropriate educational plan is developed. Even students with severe injuries may eventually return to their former schools.

Safety at school for the student with a severe injury is an important consideration. Questions to consider about placement issues are listed below:

Health-related issues

- Is medical equipment needed?
- Are any safety precautions needed?
- How are seizures controlled?
- Is there spasticity?
- How are headaches treated?
- Are there other forms of pain?
- Are medical procedures needed during the school day?
- Is medication needed and what are possible side effects?
- Does the student have stamina for a full day?
- Are rest periods needed?
- Are there visual or auditory problems?

Self-help skills – does the student need help...

- Eating
- Toileting
- Putting on/removing clothing such as outerwear and gym clothes
- Accessing the locker in a middle or high school setting
- Performing other activities of daily living

Mobility – does the student need...

- Barrier-free environment
- Assistance with transfers
- Equipment

Rehabilitation therapies - does the student need...

- Speech, occupational, and/or physical therapy
- Psychological counseling
- Assistive technology
- “Educationally-relevant” or “medically necessary” therapies
- Schedule for therapies

Communication - does the student need...

- Augmentative technology
- Note-taker
- Sign language interpreter

Behavior - does the student need...

- Behavior modification plan
- Person to oversee/monitor the plan
- Classroom or individual aide
- Structure (defined by type and amount)

Supervision - can the student handle...

- Unstructured times like before school, recess, and lunch
- Structure/cueing within the classroom (define amount and type)

There is no one specific placement for all students with brain injuries. The goal is to have the student participate in the least restrictive environment that will enhance the student's abilities and take into consideration any disabilities or special needs. However, initially it may be beneficial to provide more intense support to minimize fatigue and academic, social or emotional frustration.

Chapter 8

Transitional Planning

Transitional planning for school re-entry can be simple or complex, depending on the student's injury, rehabilitation and recovery. With rehabilitation and the support of family, friends and the community, many students with brain injuries are able to resume some pre-injury activities with a variety of creative supports.

Students who have experienced a mild brain injury generally do not experience a transition like that of a student with a moderate or severe injury. More likely, the student with a mild brain injury will seek help and support from the school nurse, teacher(s), guidance counselor, or child study team to address changes in academic performance. Various strategies and interventions can be developed to accommodate the student's needs.

Students with moderate and severe brain injuries are most likely to have been in a hospital or rehabilitation program where some transitional planning will take place to address the student's needs to return to the school setting. It is important to include members of the rehabilitation team (medical doctor, neuropsychologist, physical, occupational and speech/language therapists) in planning the student's transition back to school. Others to involve include the school principal, school nurse, Child Study Team, guidance counselor, teachers, school-based therapists, parents and student. A rehabilitation nurse (medical case manager), assigned by the insurance company, may also be involved.

Students often return to school in the midst of recovery from brain injury. Recovery from a brain injury may take weeks, months or years. Often recovery is slow and incomplete. Factors that affect recovery are:

- age at the time of injury
- time that has lapsed since the injury
- length of coma and post traumatic amnesia
- personality characteristics prior to the injury
- intellectual and functional levels prior to the injury
- cause, location, and severity of the injury
- support systems
- type of environment and treatment since the injury
- overall medical health

Just as each brain injury is different, so is the course of treatment. Rehabilitation is usually multidisciplinary and includes physical, occupational, speech, cognitive and recreational therapy, in addition to medical management. It can occur in an in- or out-patient rehabilitation center, a therapist's office, or in the home. It is important that the school nurse communicate with the rehabilitation team prior to a student's return to school to help the transition process.

If a student has been classified as eligible for special education and related services, then a case manager from the student's home school district should be designated to ensure that clear and ongoing communication occurs between the family and professionals involved. It is essential that the student, family, school staff and peers be prepared for the student's return. The school case manager may be invited to attend any hospital or rehabilitation patient conferences to learn about the student's needs. Frequent meetings are important, even after transition occurs, to continually review, evaluate and change goals as the student's needs change.

If a student has particular health concerns, the school nurse plays a vital role in transitional planning as the initiator and coordinator of the Individual Health Plan (IHP). The school nurse assures that specific health recommendations in the IHP are implemented. The school nurse also can play a pivotal role in this process

by communicating with the rehabilitation team, school staff members, the family and the student as appropriate. (See back of guide for a sample IHP)

Preparing school staff

All staff who will be working with the student need to be informed about brain injury and what to expect. Hospital or rehabilitation staff typically welcome the opportunity to visit the school and provide information about brain injury.

The school nurse is knowledgeable about medical terminology and the physiological basis of the changes caused by a brain injury, and consequently is an excellent resource.

It is important for the school staff to understand that deficits or changes are not the result of laziness, lack of discipline or malingering. Any changes in the student's appearance or ability to ambulate need to be described. Behavioral and communication strategies, including how information or directions should be presented to the student, should be reviewed, along with methods for handling any assistive equipment. Staff need opportunities to have any concerns addressed. A school nurse can provide valuable insights to other school staff.

Preparing peers

Peers often think that the student's return to school after a brain injury means full recovery. They may reject the student who is not fully recovered unless they are helped to understand what differences exist.

The student with a brain injury and the family should be consulted to determine what information they want shared with peers.

While attention to privacy must be considered, peer acceptance can be facilitated if peers understand how the brain injury has affected the student. Creating a "circle of friends" may be helpful to promote social transitions for the student with a brain injury.

Someone who is comfortable and knowledgeable about the student with a brain injury is the ideal person to talk to friends and classmates. This can be a parent, older sibling, teacher, or other professional. Peers are more likely to become comfortable with the student if they are given information and have questions and concerns addressed and answered.

Questions typically asked by peers are:

"How much will he understand?"

"Should I talk slowly or louder?"

"Will she be able to walk, talk, and eat by herself?"

"Just what should we expect and how should we treat him?"

Students of all ages and abilities can be quite flexible if an atmosphere is created that will allow for peer interaction as a normal psychosocial process. The decision about how much to share and what format to use is a personal one. If the student with a brain injury is the person providing the information, make sure that the student is comfortable being the speaker. In this case, having the student meet with small groups may be preferable to a large audience.

Preparing the family

Since many students with brain injuries have no prior experience with special accommodations or special education, families need information on the special education or Section 504 process, special services, and development of an IEP or Section 504 Plan. Having recently learned medical terminology, they may now have to learn new terminology for special education. Given the stresses they have already faced, these families need to be treated with special sensitivity and support.

The family probably knows more about brain injury and the student's needs than school staff at this point. Many of these families have participated in numerous meetings about their child. They are a vital link connecting rehabilitation and the school system. Thus, the active participation of these families should be encouraged in developing school re-entry plans.

Siblings need special consideration. They may have witnessed the injury. They have lived through the emotional stress with their family. Siblings may feel stressed and even jealous or resentful about all the attention given to the student with a brain injury. Many siblings experience dramatic family turmoil as the reality of brain injury and the recovery process unfolds over time. They may have already made many accommodations for their sibling, like changing bedrooms or accepting more responsibility for household chores. Siblings are often expected to assume responsibility for recreational activities for their sibling with a brain injury.

Teachers, school nurses, and guidance staff can monitor siblings to identify needs for any accommodations due to preoccupation, reduced concentration, and changed moods or behaviors. Formal or informal counseling may be beneficial to provide an outlet for fears and frustrations and to provide emotional support.

Preparing the student with a brain injury

It is often helpful to review assessment findings with the student using developmentally appropriate terms. For example, even young children may be able to understand that they are having difficulty remembering things since they hurt their heads. They also need to know that learning some subjects may be more difficult than it used to be. This may help them better accept necessary modifications. Having some idea of the effects of the injury helps establish a foundation for learning self-advocacy skills.

Even when the student is returning to a familiar school, concrete strategies such as touring the school to review the physical layout and renew acquaintances can be helpful. Spatial organization, memory, and/or mobility may have been affected. If there is a change in school placement after the injury, a tour is even more important.

The student with a brain injury can prepare for interactions with peers and staff by having discussions and using role-plays to anticipate reactions and questions.

It is important to monitor how well the transition has occurred by speaking with family members, teachers, peers, and the student on a periodic basis after the student returns to school. The transition back to school is a process of adjustment for the student, family, peers, and school staff.

Special considerations for adolescents and older students

Most adolescents and older students have goals and plans for the future. After a brain injury, these goals may need to change or be achieved differently. By being sensitive to these uncertainties and changes, school nurses and school staff can help the student develop and achieve new or more appropriate goals for life after high school.

College is an option for some students with brain injuries. With the right preparation and guidance, students are choosing colleges appropriate to their needs and having success. Increasingly, colleges are available that offer a spectrum of services to students with special needs, including those with brain injury.

For other students not interested or able to attend college, appropriate postgraduate options need to be explored. Options may include vocational training, employment (with or without support), or community participation.

“Transition services” is defined as a coordinated set of activities for a student, designed within an outcome-oriented process, that promotes movement from school to post-school activities, including post secondary education, vocational training, integrated employment (including supported employment), adult services, independent living, or community participation.

Chapter 9

Role of the School Nurse

The skills, experience and responsibilities of the school nurse provide an excellent opportunity to become an advocate for the student with a brain injury within the school system. The nurse can also play an important role in other areas:

- prevention of brain injury
- coordination of health care issues and services in the educational setting
- assistance to educators by sharing knowledge about brain injury.

Advocate

The school nurse has the medical background to advocate for students with brain injury, particularly in cases of mild brain injury. A school nurse may be the first person to recognize that there is a connection between a recent concussion and a student's sudden onset of academic or health difficulties. This is also the person who may recognize the crucial connection between a documented preschool brain injury and an elementary student's present difficulties in school. Frequent trips to the nurse's office often signify that a student is having difficulties with some part of life. The school nurse can ask questions to determine whether or not a recent unreported mild brain injury or concussion may be the basis for the current problem.

The school nurse understands the medical basis for the changes that a student experiences after a brain injury. The nurse may be a sympathetic listener for a student who is having a bad day. The nurse's office can be a haven of understanding in the midst of difficult and confusing days at school. Often the nurse's office is the place where a student, experiencing the fatigue that accompanies brain injury, can go to rest or nap to get through the rest of the school day.

Prevention

The school nurse is the professional in the school district best suited to advocate for brain injury prevention. Programs that deal with:

- drug and alcohol abuse
- firearms safety
- driver education
- pedestrian safety
- protective helmets for biking, boarding, skiing and horseback riding
- sports safety
- violence prevention
- conflict resolution

are all appropriate places to include a message about the importance of protecting the brain from injury.

Many of these programs are already in the schools, but do not make the connection between "safety" and preventing a brain injury that can dramatically alter a student's future. School nurses can coordinate with staff implementing these programs to ensure that a message about brain injury prevention is included. The Brain Injury Association of New Jersey has materials and information about programs developed specifically for the prevention of brain injury. These programs provide a comprehensive approach to overall wellness and injury prevention in schools and communities.

Coordinate

When a child with a mild, moderate or severe brain injury returns to school, the school nurse plays a vital role coordinating a successful reentry. Many students with brain injuries return to school with a variety of health related issues. The school nurse, as coordinator for health related issues, can ease the stress for the student, family and staff.

The *Standards of School Nursing Practice* (American Nurses Association) requires using the nursing process in the school setting. Standard III *Nursing Process*, states:

“The nursing process includes Individualized Healthcare Plans (IHP) which are developed by the school nurse.”

The IHP provides the format to record each step in the nursing process. It focuses on the specific health needs and problems of a student at a given time in their development and educational career. Much like the individualized education plan (IEP), the IHP outlines the plan of health-related services and programs required to support the student’s safe and successful functioning in the school setting. Development of an IHP provides for effective and efficient delivery of health-related services that promote school success for the student and reduces the liability of the school district. A sample of an IHP for a student with a traumatic brain injury is included in the Appendix.

Educate

In-Service training

The school nurse can assist by coordinating an in-service training in consultation with the rehabilitation team, and a staff person or volunteer from the Brain Injury Association of New Jersey (BIANJ). School staff is likely to have many issues and questions that need to be addressed so that everyone who has contact with the student is comfortable with the plan for reentry. People may react with fears associated with working with a new and unfamiliar situation. Knowledge about the student with a brain injury’s needs and how to accommodate those needs will often alleviate fears.

A successful in-service is informative about brain function, brain injury, and the effects on the specific student returning to school. Information about different types of seizures and medications and their side effects is very helpful information for school staff. Most students with brain injury become easily fatigued and frustrated. It is important for staff to understand that these issues are real, based upon physiological changes in a student’s brain. They are not manipulations by the student to “get out of doing work.” Staff needs to know exactly what to do when they recognize the symptoms of fatigue and frustration.

Educate staff

Very often it is difficult, particularly for a teacher, to make allowances in the classroom for a student with a brain injury because such allowances are perceived by other students as favoritism. The school nurse is in an excellent position to educate the teacher and students about the medical necessity for periodic rest or breaks for food. It can be comforting for school staff to understand that any changes in the student’s behavior can immediately be reported to the nurse. Traumatic brain injury is a recent addition to the criteria for eligibility for special education and related services. School staff needs information about brain injury as situations arise while working with an affected student.

Long-term Effects

One of the biggest challenges facing the school nurse is educating school personnel and parents about the possible long-term effects of mild brain injury. When a student sustains a mild brain injury, it is imperative that the school nurse share information about concussion with teachers, counselors, coaches, parents, and others who interact with the student so they can understand what has happened and help meet the student's needs. The cumulative effects of multiple concussions are a serious issue that must be addressed by school administrators. The school nurse can provide program materials such as the "Concussion in Sports Consensus Statement" (see Appendix) to physical education staff and coaches to ensure that students, especially those with prior concussions, have a safe and healthy school experience.

Intervention

The school nurse may be the one professional on staff with the understanding to associate recent changes in a student's behavior, like frequent visits to the nurse's office because of headaches, with a recent brain injury in the gym. Intervention for mild brain injury will not happen unless someone in school or at home can make that connection. A student with an untreated mild brain injury has often lost friends, fallen behind in schoolwork, and/or been "in trouble" at home or in school because the brain injury remains undiagnosed. The school nurse is in the best position to gather pertinent information that could lead to early identification and intervention.

Chapter 10

Personal stories

How life changed for Katie, Kevin, Eric and their families

Three personal stories show different options and interventions for children with mild, moderate and severe brain injuries. They show how information in this guide can be used to make a difference.

Katie's mild brain injury

Katie was in second grade when she brushed up against a moving school bus. She bounced back from the bus, bumping her head on the curb. Katie bruised her ribs and shoulders and lost consciousness for about one minute. Afterwards, she was dazed, held her head, and kept saying that her head ached.

She was taken to the local hospital's emergency department and had skull and chest x-rays. The results were normal and she was sent home. Katie continued to complain of neck and head pain, nausea, and a ringing or buzzing noise in her head. Her family took her to their chiropractor who performed some spinal adjustments.

Katie was out of school for one week. Upon returning to school, she still complained of head pain and ringing in her ears. She reported that the pain and noise distracted her and made her a little tired. These symptoms lessened over the first three months following the accident.

In first grade before her injury, Katie scored between the 75th and 98th percentile ranks on her achievement testing and had been a good student. Three weeks following the accident, she took her second grade achievement tests and scored much lower, between the 30th and 50th percentile. Reading and arithmetic scores had the most dramatic decline. The teacher noticed that Katie found it hard to retain new information and that she read more slowly. She often had to reread material, sometimes several times, to understand the information. Katie also had some difficulty with writing.

Her family had noticed changes too. They noticed that Katie was unhappy, irritable and more withdrawn. Her family had consulted an attorney about the accident. As the attorney gathered information about Katie's injuries, she recognized the symptoms of post-concussive syndrome. She referred Katie to a neuropsychologist, who confirmed the presence of cognitive slowing and attention difficulties due to a traumatic brain injury.

The neuropsychologist recommended to Katie's family that they write a letter to the Child Study Team (CST) at her school to request an evaluation for special services to help her with schoolwork. The neuropsychologist also recommended that Katie receive outpatient cognitive rehabilitation services. Specifically, rehabilitation was suggested to help Katie understand and deal with the changes she was going through from the concussion. She also needed help to develop compensatory strategies to cope with these changes in order to be successful at school again.

The Child Study Team evaluation was completed and determined that Katie did not require services under IDEA. They suggested that the rehabilitation center and school work together to develop a 504 plan. The CST gave information about 504 to Katie's family. They discussed how the strategies that Katie needed could be spelled out in a 504 plan and carried out by the classroom teacher.

Katie's parents were confused and sought help to understand what was the best thing to do for their daughter. They contacted the Brain Injury Association of New Jersey and were put in touch with an advocacy group. An

advocate attended the school meeting with Katie's parents and helped them to work out a 504 plan that was clear, but flexible. This seemed important because Katie's needs were not completely understood but she was continually improving.

Many aspects of the first month were rocky. Katie did not follow through with homework for school and was tired by the time she got to her twice-weekly rehabilitation appointments in the afternoon. A meeting was called where the rehabilitation therapist attended and brainstormed with Katie, her parents and the school staff. A modified plan was developed that increased Katie's rehabilitation hours. Even though this sounded like a step backwards to Katie's parents, they agreed to try it because the rationale made sense. The rehabilitation therapist's plan was to use Katie's homework as part of the therapy content and to develop routines, organizational study skills and attention and learning strategies within the sessions. Recognizing that Katie experienced periods of mild fatigue at school, she was scheduled to rest in the nurse's office twice a day. Communication between the rehabilitation therapist and school staff was set up on a regular basis to address problems immediately.

The 504 plan was updated and revised, initially every six weeks and then once each marking period after Katie's performance improved and held steady. The same was true with the rehabilitation services. After one month, Katie's time in rehabilitation was cut back to two hours a week. Then it was weaned to once a week, every other week, and finally down to telephone check-ins over a period of three months. What had felt like a lifetime was a school year. Katie and her parents still notice some minor cognitive changes that remain, but Katie is active and successful in school after a year. The 504 plans were discontinued in mid-third grade, with the knowledge that reevaluation and rewriting of a 504 plan would be done if any problems occurred.

Comments

This case shows the importance of not being afraid to seek out and use community resources to help a student's reentry to school after an injury. Parents often hesitate to disagree with a school's recommendation or are afraid to bring others into the school's territory. Here, the combination of an informed lawyer, a neuropsychologist's recommendations, help from an advocate, and the rehabilitation staff's involvement were all important pieces in the success of Katie's return. Even though information is available about brain injury, not all school systems have expertise in this area. Most school staff will work cooperatively with community resource people because it is in the best interest of a student.

Kevin's moderate brain injury

At the time of his injury, Kevin was 16 years old. He was a junior in high school and was considered by his family and teachers as a "good kid" who took a lot of risks. Kevin was a C student and had run-ins with other kids now and then, as well as detention for minor offenses. Kevin was a passenger in a car driven by his best friend when they were involved in a motor vehicle crash. Kevin was thrown several feet after the crash. His friend died.

Kevin was in the hospital's Intensive Care Unit for one week, spent two weeks in a Brain Trauma Unit and then had outpatient rehabilitation for 8 weeks. He was unconscious for 20 hours and had seven days of post-traumatic amnesia. The CT scans showed bruising and swelling of frontal, temporal, and parietal lobes in his brain.

After he was discharged from the hospital, Kevin found it hard to remember things, follow directions, organize his thoughts, express himself, and plan his time. It took him longer to process information and respond to people than before his brain injury.

In addition, his parents worried about how he was reacting to the death of his friend. Because expressing himself was harder for Kevin after his injury, it was difficult to know how he felt about both the loss of his friend and his own loss of memories and abilities.

Kevin's parents contacted the school right after the accident. They gave permission to the staff at the brain trauma unit and cognitive rehabilitation program to have ongoing contact with the school to provide updates on his progress and plan for his return to school. Rehabilitation staff went to the school and provided brain injury education for Kevin's peers.

It was suggested to Kevin's parents that he be classified to receive special education services to better meet his needs. Kevin's parents sought other professional opinions and were put in touch with the Brain Injury Association of New Jersey and with a parent advocacy group, SPAN, to help them. They made the decision to take advantage of special education services and they felt that turned out to be a positive move. As part of the Individual Education Plan (IEP) process, an initial transitional plan was also proposed.

Kevin's school reentry began with home tutoring in combination with outpatient rehabilitation. (He began tutoring the second week he was in the rehabilitation program.) The rehabilitation team and the tutor met weekly to exchange information. It was during this stage of recovery that Kevin also began individual counseling with a psychotherapist to help him cope with loss and grief issues and to adapt to internal changes. He was also receiving medication for depression.

Kevin progressed to a half day at school followed by outpatient rehabilitation therapies (OT, PT, and Speech) in the afternoon. After two months, Kevin was ready to increase his time at school. He began to stay for lunch and gym class.

Staff at school began to see that Kevin was having more difficulty with social interactions. He was experiencing altercations with peers and sometimes with teachers and other school staff. Especially when fatigued, he became verbally abusive. School staff met with Kevin and his parents to explore strategies to help him with the extended school day and how to handle the less structured activities that had been added to his schedule.

Kevin's psychotherapist was also consulted. Together with the child study team, Kevin, and his parents, a plan was developed to address his behaviors. Kevin's behavior began to improve with his increased awareness of what he was doing and consistent feedback about his behavior.

At the close of Kevin's junior year, he was in school two-thirds time. He attended an extended school year program to increase his skill level and complete credits for his junior year. Kevin's goal for his senior year was to develop his vocational direction and be a full-time student with a half-day of academics and a half-day of workstudy. These goals were added to his IEP and transition plan as part of the ongoing revision process. Kevin's child study team also contacted the Division of Vocational Rehabilitation Services to consult with them about post high school services available to Kevin.

Although Kevin was making good progress in the vocational program, it was evident that he was not ready, vocationally or academically, to enter the work world. After reviewing his skills and needs, Kevin, his parents, and the child study team decided to hold off graduation for one year. Special arrangements were made for Kevin to attend the graduation ceremony and related activities without receiving a diploma. This meant he could be part of this big event but not lose his educational benefits.

Kevin, currently 19 years old, attends two academic classes and a vocational training program each day. His social skills and ability to self-monitor his behavior have continued to improve as well as his reading and math skills. While continuing to feel sadness at times over the effects of his own injury and the loss of his friend, Kevin has been able to express that he is not overwhelmed by this and has "graduated" from seeing a counselor once a week for support. He has referrals to brain injury support groups as well as a "clubhouse" type social group if he wishes to explore these resources.

Comments

Kevin's experience illustrates the steps involved in going through the rehabilitation stage, school reentry, and transition processes with sensitivity to the effects that cognitive impairments, grief, and personal adjustment can present for an adolescent with a brain injury. This example demonstrates good communication among the family, rehabilitation staff, school personnel, and DVRS. Delaying graduation allowed Kevin time to develop his academic and vocational skills in order for him to be better equipped to enter the work world. It also demonstrates how a coordinated effort to address behavioral issues in a positive way can have a beneficial outcome for the student.

Eric's severe brain injury

As a result of an auto accident, 14 year old Eric, was propelled from a car and had a traumatic brain injury and severe chest trauma. He was hospitalized for several months and spent six months in a low-level coma. After his transfer to a rehabilitation hospital, Eric received physical, occupational and speech therapies, and later cognitive rehabilitation.

He regained his speech eight months post injury and started academic tutoring shortly thereafter. A child study team from his local school district became involved in his case once tutoring was requested. At that time, Eric was deemed eligible for special education services under the category of traumatic brain injury. One year after his accident, Eric had progressed to reading, writing, and simple mathematics. He was walking with a walker and was able to eat enough on his own to have his feeding tube removed.

Progress continued, and as discharge from the rehabilitation hospital neared, Eric's child study team case manager began to attend the monthly case conferences to plan for the transition to school. Eric's parents obtained the services of a private consultant, specializing in brain injury. This consultant instructed his teachers about Eric's unique needs and helped develop an appropriate program at school. She helped school personnel understand the effects of Eric's brain injury and introduced strategies to maximize his classroom instruction.

Once discharged from the hospital, Eric attended an outpatient cognitive rehabilitation program four days a week, followed by cognitive/academic tutoring and therapies (OT, PT, and Speech.) On Fridays, he attended a full day at his home high school where he received all academic instruction in the resource room, plus some speech therapy. He had an instructional aide to help him navigate the halls and provide extra help in class.

Eric's IEP included assistive technology. His primary assistive device was a laptop computer with word prediction software, a screen reader and scheduling/ date book software. Eric was mainstreamed into a computer class where he typed any notes or assignments necessary for his other courses into his laptop.

At that point, Eric was considered a ninth grader operating on a 4th – 6th grade level. Before his accident, Eric had functioned well above grade level. Much time was taken to modify his curriculum, develop appropriate goals and strategies and put together a transition plan. Frequent meetings among his parents, child study team members, and the TBI consultant were held to review progress and update the IEP as needed.

The following September, almost two years after his accident, Eric attended a resource program science class daily in addition to his other classes. He continued to receive his related therapies after cognitive rehabilitation therapy sessions and attended school all day on Friday. After the second semester that year, Eric's inschool program was increased to three periods with two periods of resource program science and history and one period of computers. Transition planning was continually updated with special attention to services Eric might need after graduation.

After a year and a half of services in a rehabilitation center, Eric was discharged. He returned to school the following September as a full-time junior. He was mainstreamed for art and computers, and continued his resource program for academics. He also had three periods of one-on-one speech therapy in school per week. He received PT and additional academic support along with speech therapy at home. He became involved in community reentry activities with a recreational therapist. Again due to his progress, Eric's transition plan in his IEP was updated to include new possibilities after high school.

By mid-junior year, testing revealed that Eric's academic achievement scores were between the 7th and 12th grade level. His functional cognitive performance remained impaired, especially in memory, the ability to organize his thoughts, and problem solving. The school nurse identified absence seizure activity and Eric was

subsequently placed on anti-seizure medication by the neurologist.

Programming in school had become a bit more problematic because his resource program curriculum generally tapped into Eric's prior knowledge and did not challenge him with new material. One regular academic class had been added to his schedule with the additional support of an aide and a supplemental class to reinforce and modify the regular class materials. Programming for his senior year included three mainstream classes with extra support built into his program. His IEP clearly stated what modifications would be made to the regular class curriculum, what accommodations would be required and who would be responsible for its day-to-day implementation. Accommodations written into the IEP included alternative test materials, modified assignments, tape-recorded classes for later review, study guides, and note takers.

As Eric's developing abilities changed his future educational needs, options were investigated at the post-high school level focusing on colleges and other post secondary schools with Section 504 accommodations and support programs. Eric, his parents and the rest of his child study team obtained information on possible programs and Eric and his parents visited various schools. They ended up choosing a county college with 504 accommodations.

Comments

This case illustrates the slow, steady and creative school reintegration process. It also demonstrates the flexibility a school offered and the positive results for the student. By looking at Eric's unique needs, planning and following through, programming went relatively smoothly.



BRAIN INJURY ASSOCIATION

Since 1981

OF NEW JERSEY

EDUCATION ■ OUTREACH ■ PREVENTION ■ ADVOCACY ■ SUPPORT

825 Georges Road • 2nd Floor • North Brunswick, NJ 08902
Phone: 732-745-0200 • Fax: 732-745-0211 • Website: www.bianj.org

DEVELOPED BY
ORIGINAL MEMBERS OF THE
CONCUSSION COMMITTEE

Barbara Geiger-Parker
Brain Injury Association of New Jersey

Robert Baly
New Jersey State Interscholastic
Athletic Association

Jill Brooks, PhD
Head to Head Consultants, PA

Ronald J. Czajkowski
New Jersey Hospital Association

Mike Finkelstein
Rutgers University Youth Sports
Research Council

Nina Geier, MS, MPT, PT, ATC
Community Skills Program

Gregg S. Heinzmann, EdM
Rutgers University Youth Sports
Research Council

Phil Hossler, ATC
Athletic Trainers' Society of New Jersey

Stephen Rice, MD, PhD, MPH,
FAAP, FACSM
Jersey Shore University Medical Center

Ronald C. Savage, EdD
Rehabilitation, Education & Case
Management Services

Joanna Boyd
Caroline Liepf
Jill Schulman
Brain Injury Association of New Jersey

Concussion in Sports Consensus Statement

CONCUSSION – definition and features

A concussion is a mild traumatic brain injury (MTBI), induced by mechanical forces that immediately disrupt the normal functioning of the brain.

When playing sports, if there is any doubt that a player might have sustained a concussion, the player should be removed from the game or practice. Never participate in physical activity if *any* sign or symptom of MTBI is present.

All concussions should be evaluated by knowledgeable health professionals to measure severity, monitor progress over time and properly manage the injury. Resolution of clinical and cognitive symptoms often occurs spontaneously, typically following a sequential course.

The mechanical trauma that causes a concussion may be either a direct blow to the head, face, and neck or an indirect blow elsewhere on the body that transmits an “impulsive” force to the head.

Concussion symptoms usually appear immediately, although they can present later, and affect a wide array of mental functions. A stunned, confused state is a hallmark of MTBI. Loss of consciousness may also occur; however, most concussions do NOT involve loss of consciousness. Memory loss, dizziness, emotional instability, disturbances of equilibrium, vision, and cognitive functions, as well as headache, nausea and vomiting are common symptoms.

Concussion results in immediate chemical changes within the nerve cells of the brain, which usually return to normal over several days or weeks. Neuroimaging studies typically show grossly normal anatomic structures.

A concussion may have widely varied clinical consequences (from mild to severe); like all injuries, however, it is imperative that the injured body part be afforded adequate time to heal. Resting the brain must not only involve ceasing physical activity for a period of time, but also should include a break from challenging cognitive activity as well.

Concussions are not simply “a blow to the head”; as brain injuries, concussions must always be taken seriously.

This definition has been developed by a committee of professionals as part of an on-going effort to bring together a statewide partnership on concussion awareness and prevention in youth sports.

March 2005
Revised July 2005

WWW.SPORTSCONCUSSION.COM

The Concussion in Sports Campaign is made possible through the New Jersey Traumatic Brain Injury Fund

Glasgow Coma Scale

ACTIVITY	SCORE	INFANT RESPONSE	CHILD RESPONSE	ADULT RESPONSE
EYE OPENING	4	Spontaneous	Spontaneous	Spontaneous
	3	To speech or sound	To speech	To speech
	2	To painful stimuli	To pain	To pain
	1	None	None	None
VERBAL	5	Appropriate words / sounds; social smile; fixes and follows	Oriented appropriate to age	Oriented to person, place, month, year
	4	Cries but consolable	Confused	Confused
	3	Persistently irritable	Inappropriate words	Inappropriate words
	2	Restless / agitated	Incomprehensible words	Incomprehensible words
	1	None	None	None
MOTOR	6	Spontaneous movement	Obeys commands	Obeys commands
	5	Localizes pain	Localizes pain	Localizes pain
	4	Withdraws to pain	Withdraws to pain	Withdraws to pain
	3	Abnormal extremity flexion	Abnormal extremity flexion	Abnormal extremity flexion
	2	Abnormal extremity extension	Abnormal extremity extension	Abnormal extremity extension
	1	None	None	None

Reprinted with permission from: Houston, J, Warnock, L, and Lash, M. Traumatic Brain Injury in Children and Teens: A Guide for Families. Hanover, NH: New Hampshire Emergency Medical Services for Children Project at Dartmouth Medical School, 1998.

Rancho Los Amigos Scale of Cognitive Functioning

Level	Child's Response	Suggestions for Parent
I. No Response	Unresponsive <ul style="list-style-type: none"> • appears to be in a deep sleep • hold a hand • rub lotion on skin Speak calmly and slowly <ul style="list-style-type: none"> • assume your child can hear • be sensitive to what is said near her 	Show affection <ul style="list-style-type: none"> • kiss your child
II. Generalized Response	Non-purposeful body movement <ul style="list-style-type: none"> • to pain or touch • to familiar sound or smell 	Bring in familiar things <ul style="list-style-type: none"> • special blanket or stuffed animal • tape recordings of voices or music
III. Localized Response	Localized, specific body movement <ul style="list-style-type: none"> • pulling at tubes & catheters • inconsistently follows simple commands 	Recognize & point out new responses to your child & health care provider Don't be discouraged if responses come and go
IV. Confused-Agitated	Agitated <ul style="list-style-type: none"> • constant movement • thrashing about in bed • extra sensitive to movement, light, noise Confused <ul style="list-style-type: none"> • may not make sense • very short attention span • may be rude or aggressive • unsafe 	Take care of yourself <ul style="list-style-type: none"> • take a break and get away • accept help Minimize distractions <ul style="list-style-type: none"> • keep the room quiet & limit visitors • speak slowly & allow time for child to answer Help keep environment safe for your child Don't try to reason or argue with your child Don't be embarrassed by child's behavior
V. Confused-Inappropriate	Appears alert Follows simple command most of the time Easily distracted Confused <ul style="list-style-type: none"> • memory severely impaired • unable to separate past from present • may wander off Inappropriate <ul style="list-style-type: none"> • agitated behavior remains • conversations disjointed 	Be your child's memory <ul style="list-style-type: none"> • share details of your child's past • discuss events of the day • identify visitors & caregivers for child • clarify the past from the present • reorient your child to the present environment Provide and protect scheduled times of rest Be patient, avoid pushing child to perform
VI. Confused-Appropriate	Behavior is less bizarre & more appropriate Follows simple directions Performs simple previously learned tasks Newly learned tasks quickly forgotten Things learned before injury are clearer Becomes confused in unfamiliar settings	Be consistent Give clear directions Repeat, repeat, repeat! Encourage & allow increasing independence with simple daily tasks
VII. Automatic-Appropriate	Performs daily routine automatically Unsafe without supervision in unfamiliar settings <ul style="list-style-type: none"> • difficulty making decisions & solving problems • poor judgment and planning skills • lacks understanding of limitations resulting from the injury Remembers new things, but at a slower pace	Supervise child's reintroduction into community Provide opportunities for increased independence <ul style="list-style-type: none"> • give your child chores to do at home • discuss & practice situations your child will encounter outside the home Avoid teaching unnecessary skills
VIII. Purposeful-Appropriate	Alert and oriented Remembers past and present events Uses new skills appropriately Independent with age-appropriate activities May exhibit ongoing deficits <ul style="list-style-type: none"> • decreased ability to learn; slower thought processing • limited tolerance for stress • difficulty with reasoning and judgment • confusion in new or unusual situations • easily fatigued 	Recognize & accept child's strengths and weaknesses <ul style="list-style-type: none"> • allow independence in areas of strength • provide structure & supervision for weaknesses Communicate regularly with child, outpatient rehab team, and school to monitor progress Identify & utilize community resources benefiting your child and family Advocate for what your child needs

Reprinted with permission from: Crowley, C, Smith, N. When Your Child Has a Brain Injury: What You Need to Know. Charlotte, NC: Charlotte Institute of Rehabilitation and The Hemby Pediatric Trauma Institute, Carolinas HealthCare System, 1996.

Individualized Healthcare Plan

Traumatic Brain Injury

<u>Assessment Data</u>	<u>Nursing Diagnosis</u>	<u>Goals</u>	<u>Nursing Interventions</u>	<u>Expected Outcomes</u>
ND1 and ND8 Previous cognitive function. Current cognitive function. Ability to participate in activities as prior to TBI.	Self-esteem alteration related to changes in physical/mental abilities, grieving over loss of physical and/or psychosocial well-being and feelings of powerlessness (NANDA 7.1.2)	Student will participate in social activities with modifications as necessary. Student will develop and maintain meaningful social relationships with similar age peers.	Encourage student to ask questions & share feelings about his condition, its management requirements, limitations, the stigma it imposes and the prognosis with family, school staff, peers & healthcare providers.	Student will verbalize feelings about his concerns, grief, anger, anxiety, fears and limitations and others' reactions to his disability to appropriate adults.
Understanding/ acceptance of disability limitations, etc.	Risk for social isolation related to inability to participate in activities at same level as prior to TBI, and discomfort of peers in relating to student because of changes in abilities.	Student will develop a realistic self-image and demonstrate adaptation to and comfort with changes related to TBI	Encourage student to identify his strengths and weaknesses and signs that he is coping effectively/ineffectively.	Student will verbalize positive feelings about himself and identify individual strengths. Students will develop answers about his disability and will use them to explain to others about his disability and limitations
Available support systems within family, school and community		Student will be successful in activities that foster self-esteem. Student will be encouraged to express feelings to others.	Reinforce student's positive abilities interactions, etc. Refer student and family to support groups, counseling, family therapy, and/or clergy as indicated.	Student and family will participate in counseling and increase understanding and acceptance of the disability and to assist student to develop and maintain appropriate social skills
Behavioral issues		Student will use positive, effective coping measures to decrease stress and anxiety.	Identify student's developmental stage and assure that expectations are real for that stage. In collaboration with others, encourage student to develop appropriate social skills.	Student will participate with peers in activities that he enjoys and that give him positive feelings and enhanced self-esteem.
		Student and family will communicate feelings to one another. Barriers to social contact with peers will be minimized.	Encourage continued and age-appropriate peer relationships and activities. Provide educational opportunities for student and his peers to increase knowledge about TBI, its prevention and implications	Student will demonstrate improved social skills with peers. Student will demonstrate increase in appropriate behavior in the school/classroom setting.
		Peers will be comfortable interacting with and helping student.		Student will identify activities in which he is not able to participate as well as prior to TBI. Student will identify activities in which he can fully participate.

Assessment Data	Nursing Diagnosis	Goals	Nursing Interventions	Expected Outcomes
				Student will interact positively and successfully in classroom, small groups, lunchroom, hallways, etc.
				Student will demonstrate positive coping strategies to decrease stress and anxiety.
ND2 History of loss of consciousness. Duration of post traumatic amnesia	Risk for alteration in student role related to cognitive and or memory deficits resulting in disorganization, poor retention of information and instructions	Student will achieve academic success appropriate to chronological age and cognitive abilities	Refer to CSE or 504 Committee for evaluation of academic needs. Participate as member of interdisciplinary team to develop IEP.	IEP will be developed to address academic program needs.
Previous level of cognitive function or requirements for special education services.	Risk for school failure. Problems with fine motor coordination (NANDA 3.2.1)	School activities will be based on students level of tolerance and ability	Develop IHP that addresses physical and academic needs. Assist family and school staff to identify barriers and implement modification in academic program, home and school environment, and scheduling.	IHP that addresses physical and health-related academic needs will be in place.
Results of psychological testing. Current level of cognitive functioning.		A system and emotional support will be available to the student.	Arrange for assistance/modification for daily activities: full-time aide; computer; extended time for test taking; note-taker; someone to carry materials when moving within building or to school bus.	Student will actively and successfully participate in his academic program.
Documented memory problems. Identified need for adaptations or modifications to optimize academic performance.			Collaborate with OT/PT to monitor self-care, improve ability, and maximize potential and independence.	Student will increase academic achievement with modification in curriculum, assignments, and grading as needed.
Behavioral issues			Instruct and encourage school staff to optimize independence in self-care, academics and decision making.	Student will utilize assistive devices at home and school to achieve optimal success.

References

- Cohen SB: Adapting educational programs for students with head injuries. *Journal of Head Trauma Rehabilitation* March 1991;6(1):56-64.
- Crowley, C, Smith, N. *When Your Child Has a Brain Injury: What You Need to Know*. Charlotte, NC: Charlotte Institute of Rehabilitation and The Hemby Pediatric Trauma Institute, Carolinas HealthCare System, 1996.
- DePompei R, Blosser J: Preparing education professionals for meeting the needs of students with traumatic brain injury. *Journal of Head Trauma Rehabilitation* March 1991;6(1):73-83.
- Harrigan, J. IHP:Traumatic Brain Injury. Arnold, M and Silkworth C., Eds., *The School Nurse's Source Book of Individualized Healthcare Plans*, Vol II, 424-427. North Branch, MN: Sunrise River Press, 1999.
- Lash M, Cluett R: *A Manual for Managing Special Education for Students with Brain Injury*. Wake Forest, NC: Lash and Associates Publishing/Training Inc., 1998.
- Lehr E: *Psychological Management of Traumatic Brain in Children and Adolescents*. Rockville, MD, Aspen Publishing, 1990.
- Milton SB, Scaglione C, Flanagan T, Cox J, Rudnick FD: Functional evaluation of adolescent students with traumatic brain injury. *Journal of Head Trauma Rehabilitation* March 1991;6(1):35-47.
- New Jersey Administrative Code, Title 6A, Chapter 14 Special Education, 2000.
- Restak R: *The Brain*. New York, NY: Bantam Books, 1991.
- Savage RC, Wolcott GF, Eds.: *An Educator's Manual: What Educators Need to Know About Students with Traumatic Brain Injury*. Washington, DC: Brain Injury Association, 1995.
- Tyler J, Mira M: *Traumatic Brain Injury in Children and Adolescents: A sourcebook for teachers and other school personnel*. 2nd edition. Austin, TX: Pro-Ed, 1999.
- Wagner, M. & Stenger, K. *Acute Brain Injury: A Guide for Family and Friends*. Iowa City, Iowa: University Hospital School and the Iowa Department of Public Health, 2000. New Jersey edition, 2001, available through Brain Injury Association of New Jersey.

Glossary of Medical and Rehabilitation Terms

Ablation: Cutting and removing a section of tissue. Cerebral ablation: cutting and removing part of the brain.

Acalculia: An inability to carry out simple arithmetical calculations.

Acquired Head Injury: Traumatic head injury that is caused by an external physical force or by certain medical conditions such as stroke, encephalitis, aneurysm, anoxia, or brain tumors – with resulting impairment that can adversely affect psychosocial, motor, communication, vocational, and cognitive/academic performance.

Affect: The emotional state of an individual at any given time.

Agnesis: Failure of tissue or an organ to grow and develop normally.

Agnosia: Inability to recognize the significance of sensory stimuli.

Agraphia: Inability to express ideas in writing.

Akathisia: Body restlessness, the urgent need for movement.

Akinesia: Loss of normal movement.

Alexia: Inability to comprehend written language.

Amentia: Sub-normal mental capacity that is congenital.

Amnesia: Loss of memory for periods of time. Several types have been noted:

Anterograde Amnesia: Inability to remember events beginning with the onset of the injury; essentially, severely decreased ability to learn.

Retrograde Amnesia: Loss of memory of events preceding the injury.

Post-Traumatic Amnesia: The period of anterograde amnesia following a head injury. The person is unable to store new information.

Aneurysm: The dilation of the wall of an artery.

Anomia: The inability to name an object that one recognizes and understands. A symptom of receptive aphasia.

Anisocoria: Pupil inequality.

Anosognosia: Unawareness of paralyzed limbs in hemiplegia; the neglect of the paralyzed side.

Anosmia: Loss of sense of smell; indicates impaired olfactory nerve function.

Anoxia: Loss of oxygen to the brain that can lead to brain damage.

Apraxia: Inability to carry out precise movements, inability to carry out voluntary acts without loss of motor power.

Aphasia: An inability, partial or complete, to understand or express language whether written or spoken, because of injury or disease of the language centers of the brain.

Areflexia: Loss of reflex activities.

Ataxia: Impaired neuromuscular coordination in voluntary muscle movements.

Athetosis: Involuntary neuromuscular movements and facial grimaces as in cerebral palsy, caused by brain lesion(s).

Atrophy: The wasting away of live tissue.

Attention: The ability to focus on one part of a complex experience.

Aura: A sensory warning preceding a seizure.

Babinski's sign: Stroking the lateral aspect of the sole of the foot from the heel to the toe with a blunt instrument causes the great toe to plantar flex (a negative Babinski sign). If the Babinski sign is positive, the great toe dorsiflexes (extends upward) and the other toes fan out. The latter is an abnormal response, and is a pathologic sign indicating contralateral pyramidal disease.

Bitemporal hemianopsia: Blindness of each temporal field of vision.

Blepharospasm: Involuntary, forcible, rapid, spasmodic contractions of the eyelids.

Brain Stem: The lower portion of the brain that connects it to the spinal column. The brain stem coordinates the body's vital functions (breathing, blood pressure, and pulse). It also houses the reticular formation that controls consciousness, drowsiness, and attention.

Broca's Area: The Brain center for motor speech, located in the posterior portion of the third frontal convolution, anterior to the lowest part of the motor cortex.

Bruit: A sound or murmur, especially and abnormal one.

Bulbar: Pertaining to the medulla.

Causalgia: A burning pain.

Cephalagia: Headache

Cerebellum: The portion of the brain that is located below the cortex. The cerebellum is concerned with coordinating movements.

Cerebral Edema: An increase in the interstitial fluid within the brain; swelling of the brain.

Chorea: Jerky, violent, rapid, uncontrollable movements.

Clonic: Rapid alternate spasms of contraction and relaxations as in epileptic seizures

Closed Head Injury: The brain is damaged within the skull, without external penetration.

CNS: An abbreviation for the Central Nervous System.

Cognition: A general concept embracing all of the various modes of knowing: perceiving, remembering, imagining, conceiving, judging, and reasoning.

Cognitive Rehabilitation (Cog-Re): Therapy programs that aid people in the management of specific problems in thinking and perception. New strategies and skills are taught to help improve function and/or compensate for deficits.

Coma: A state of profound unconsciousness from which one cannot be aroused. The depth and duration of the coma are important indicators of prognosis in closed head injuries. Termination of coma is commonly measured by attainment of a simple command level by the patient.

Concussion: The common result of a blow to the head usually causing unconsciousness, either temporary or prolonged. Physiologic and/or anatomic disruption of connections between some nerve cells in the brain may occur.

Confabulation: The fabrication of experience recounted to fill in and cover up gaps in memory.

Contralateral: Pertaining to the opposite side of the body or brain. An antonym for ipsilateral.

Contrecoup Injury: An injury occurring in a part of the brain opposite the point of impact; this is often the site of more serious damage.

Contusion: A bruising of the brain resulting from a blow to the head. This bruising causes tissue damage and bleeding within the brain.

Convergence: Coordinated inward rotation of the eyeballs and contraction of the pupils when focusing on a near object.

Convolution: An irregular convex formation in the brain; a gyrus.

Corpus Callosum: Wide bands of neural fibers interconnecting the two cerebral hemispheres.

Cortex: The convoluted outer layer of gray neural tissue that covers the brain. For convenience the fissure of Rolando and the fissure of Sylvius divide it into the frontal, parietal, temporal, and occipital lobes. Both the left and right hemispheres are similarly divided.

Corticospinal tract: Motor pathway from precentral gyrus to the anterior horn in the spinal cord; the pyramidal tract.

Coup Injury: An injury to the brain on the same side as the impact.

CT Scan (Computerized Tomography): A series of computerized x-rays taken at different levels of the brain. A scan is done soon after the injury to determine whether surgery is needed. A CT scan shows the more obvious changes, such as hematoma, enlarged ventricles, of atrophy.

Decerebration: A rigid state resulting from destruction of the cerebrum. Higher centers no longer exert an inhibiting influence on the primitive brain stem and spinal reflexes. Upper limbs are extended and hyperpronated, lower limbs are extended.

Decortication: A rigid state resulting from destruction of the cerebral cortex. Upper limbs are flexed, lower limbs are extended.

Dementia: Reduced mental capacity that is acquired due to disease, trauma, degeneration, etc.

Demyelination: Destruction or loss of the myelin sheath.

Denervate: To deprive of nerve supply.

Diplegia: Paralysis affecting both sides of the body (both arms or both legs)

Diadochkinesia: Ability to perform rapidly alternating antagonistic movements, a cerebellar function.

Dichotic Listening: A technique for stimulating simultaneously both ears of a subject with different words, usually with similar initial sounds and lengths. This is used to investigate cerebral dominance for language.

Diplopia: Double vision.

Dura Mater: The tough, fibrous outer layer of membranes surrounding the brain.

Dysarthria: Defective articulation.

Dyscalculia: Faulty calculation ability; a mild or moderate aculculia

Dysesthesia: An irritating sensation.

Dysgraphia: Impaired ability to express ideas in writing.

Dyskinesia: A defect in voluntary movement.

Dysmetria: Inability to control the range of voluntary movements.

Dysnomia: Faulty word finding ability; a mild or moderate anomia

Dysphagia: Difficulty in swallowing.

Dysphasia: An impairment of speech; sometimes used as a synonym for aphasia.

Dysphonia: Hoarseness.

Dysrhythmia: Abnormal rhythm of electrical charges in the brain; detected by an electroencephalogram.

EEG (Electroencephalogram): A recording of the brain's pattern of electrical activity used to identify abnormalities.

Encephalopathy: Any disorder of the brain.

Epileptogenic Foci: Focal areas of pathological brain tissue that appear to be related to epileptic seizures.

Evoked Potential: The measurement of electrical changes in the brain or central nervous system following environmental stimulation; e.g. light flashes in a subject's eyes will evoke sharp electrical changes in the posterior parts of the brain, and staccato sound patterns will evoke sequentially similar electrical changes in the temporal lobes.

Executive Functions: Planning, prioritizing, sequencing, self-motivating, self-correcting, inhibiting, initiating, controlling, or altering behavior in response to feedback; setting goals.

Extradural: Outside the dura.

Extramedullary: Outside the spinal cord.

Extraocular movements (EOMI): Extraocular eye movements intact. Eye muscles are moving in the correct direction due to intact cranial nerves.

Extrapyramidal System: Motor pathways that regulate voluntary and reflex movements.

Fasciculation: Involuntary twitching of the muscle groups.

Field Cut: A defect in the visual field

Flaccid: Without muscular tone.

Frontal Lobe: The area of the brain located at the front of the head on both left and right sides. The frontal lobe contributes to the control of emotions, motivation, social skills, expressive language, and inhibition of impulses. The left side of the frontal lobe is known as Broca's area. The motor strip controlling movement and motor integration runs along the posterior (back) of the frontal lobe.

Fundus: The back portion of the interior of the eyeball that allows visualization of the retina, retinal arteries and veins, and the optic nerve head.

Galea: Fibrous connective tissue of the scalp, connects the fleshy portions of the occipitofrontal muscle.

Gestalt Psychology: A school of psychology that originated in Germany in 1912 and that stressed perception and a holistic view of behavior.

Glasgow Coma Scale: An observational scale used for rating the severity of injury by assessing a child's responsiveness in three areas: motor response, eye opening, and verbal response. A severe injury is a score from 3 – 8, a moderate injury is a score from 9 – 12, and a mild injury is a score from 13 – 15.

Gyrus: A convolution or convex fold of tissue.

Haptic: Sense of touch; recognition of three-dimensional objects; stereognosis.

Hard Signs: these refer to the unequivocal, medically documented signs of brain damage, such as brain surgery, cerebral bleeding, hemiplegia, brain tumor, or penetrating head injury.

Hematoma: A localized collection of blood in an organ, space, or tissue that can be diagnosed by a CT scan. In brain injury, three types of hematoma are common: epidural (outside the brain and its fibrous covering, but under the skull); subdural (between the brain and its fibrous covering); and intercerebral (in the brain tissue). Most hematomas must be removed by neurosurgical procedures.

Hematomyelia: Bleeding into the spinal cord.

Hemianesthesia: Loss of sensation of one side of the body.

Hemianopsia: Blindness of one-half of a field of vision.

Hemiplegia: Paralysis of one side of the body.

Hemorrhage: Bleeding that occurs following trauma. Bleeding may occur within the brain when blood vessels in the skull or brain are damaged.

Homolateral: Pertaining to or on the same side.

Homonymous Hemianopsia: Blindness of the same side of the field of vision of each eye.

Hyperreflexia: Increased action of the nerves.

Hyperesthesia: Overly sensitive sensation of touch.

Hyperthermia: Abnormally high body temperature.

Hypertonia: Increased muscle tone.

Hypesthesia: Decreased sensation of touch.

Hyporeflexia: Diminished action of the reflexes.

Hypothalamus: A portion of the thalamus contiguous to the optic chiasm; is related to the control of many visceral processes and emotional behavior.

Hypotonia: Reduced muscle tone.

Idiopathic: Of unknown cause.

Increased Intracranial Pressure (IIP): An increase in pressure within the cranial cavity. Intracranial hypertension.

Infratentorial (Subtentorial): Below the tentorium (brain stem and cerebellum).

Intracranial Pressure: A measure of pressure within the skull; it must be closely monitored following a brain injury since prolonged increases in intracranial pressure can result in more damage to the brain tissues.

Intradural: Within the dura.

Intramedullary: Within the spinal cord.

Ipsilateral: On the same side; antonym for contralateral.

Kinesthesia: Awareness of the body and body parts in space; includes awareness of balance and motion.

Lasegue's Sign: Leg raising sign. Pain aggravated in back and leg when attempting to extend flexed muscle.

Limbic System: A set of cerebral structures, inside the brain and above the brainstem, believed to be involved in emotional behavior and short-term memory. It may include the cingulate gyrus, isthmus, hippocampal gyrus, and uncus.

Locus: Place, site, or location. Used in medicine to indicate a specific area or point in the body.

Lower Motor Neuron: The neuron from the brain stem or anterior horn cell of the spinal cord to the muscle. Its destruction results in flaccid paralysis.

Magnetic Resonance Imaging (MRI): A diagnostic procedure that uses magnetic fields to create pictures of the brain's soft tissue. MRI can provide a more detailed picture than the CT scan.

Maturation: The process of becoming mature.

Meningioma: A slowly growing tumor in the meninges or membranes covering the brain.

Meningismus: Signs and symptoms of meningeal irritation occurring in the absence of infection.

Memory: Assimilation, storage, and retrieval of previously experienced sensations and perceptions when the original stimulus is no longer present; learning new material; may be visual or auditory.

Micrographia: Small, cramped, handwriting that becomes smaller as it continues.

Monoplegia: Paralysis of one extremity.

Motor Aphasia: Loss of the ability to express one's thoughts in words; expressive aphasia. Caused by a lesion in Broca's area.

Myasthenia: Muscular weakness.

Myopathy: Any disease of the muscle.

Neoplasm: New and abnormal growth of tissue; tumor.

Neuralgia: pain along the course of a nerve.

Neurons: Specialized cells that conduct nerve impulses.

Neuropathy: Any disease of a nerve.

Neuropsychology: The branch of psychology that attempts to test different specific components of cognition as memory. The neuropsychologist looks into the site and mechanism of damage to specific functions.

Nystagmus: Rapid, involuntary movement of the eyeball, indicates abnormality of eye muscle control.

Obtunded: Blunted alertness, dulled behavior.

Occipital Lobe: The posterior (back) part of each side of the brain, involved in perceiving and understanding information.

Occupational Therapist (OT): Provides activity based treatment in keeping with the goal of achieving maximum independence in daily living skills. This therapist evaluates and treats cognitive and physical deficits, including limited functional use of the upper body, decreased visual-perceptual and motor difficulties with daily living skills, such as grooming, dressing, and writing.

Optic Chiasm: The structure formed by the place of crossing of the optic nerve fibers from the nasal halves of the retina. It is located in front of the pituitary gland.

Opticokinetic: Pertaining to the movement of the eyes.

Ophthalmoplegia: Paralysis of the eye muscles.

Otorrhea: Discharge from the ear; drainage of cerebrospinal fluid (CSF) from the ear.

Palsy: Paralysis.

Papilledema: Loss or impairment of motor functions.

Paraplegia: Paralysis of the lower extremities.

Paresis: Partial or incomplete paralysis, motor weakness.

Paresthesia: An abnormal sensation without objective cause such as numbness, tingling.

Parietal Lobe: The upper middle lobe of each side of the brain, involved in receiving and understanding sensations and closely linked to speech fluency and writing.

Parosmia: A disorder of the sense of smell; perverted sense of smell, indicates impaired olfactory nerve function.

Penetrating Head Injury: The brain is penetrated from the outside, as in a bullet wound (also referred to as an open head injury). Penetrating injuries tend to damage localized areas of the brain, which result in fairly discrete and predictable disabilities.

Periocular Edema: Swelling of the eyelids and surrounding tissue.

Photophobia: Unusual sensitivity to light.

Physiatrist: A physician (MD) who specializes in the area of medicine and rehabilitation. While physiatrists may treat a wide variety of illnesses, the emphasis is always on the evaluation of functional disability and prescription of treatment through therapies, orthotics, medication, and other modalities.

Physical Therapist (PT): Primary emphasis is on motor functioning. This therapist evaluates your family member's range of motion, strength, coordination, balance, endurance, and mobility skills. The physical therapist will show you how to assist your family member with an exercise program and daily activities. The need for equipment, such as a wheelchair, walking aid, or bathroom equipment is monitored and recommended by the physical therapist.

Pons: A connecting center in the brain stem for motor and sensory nerves.

Post-Concussive Syndrome: Is a specific set of circumstance that occurs following a blow to the head involving minimal or brief loss of consciousness. Symptoms of post-concussive syndrome include headache, dizziness, ringing in the ears, blurred vision, difficulties in complex attention and simultaneous processing, and decreased mental speed and memory problems. Also, there is frequently seen a personality change, such as irritability.

Post-Traumatic Amnesia (PTA): A loss of memory that occurs immediately after the injury and which may continue for weeks or months. During this time many patients are unable to organize or retrieve information. The length of PTA is regarded as an indicator of eventual recovery.

Post-Traumatic Epilepsy: A seizure disorder occurring in greater than five percent of patients who suffer head trauma. The more severe the injury, the greater the likelihood that seizures will appear.

Post-Rolandic Area: The area just posterior to the fissure of Rolando; the sensory strips, parietal, occipital, and temporal lobes.

Premorbid: Prior to the onset of illness or injury.

Proximal Instability: Impaired strength or muscle tone of the trunk, shoulder girdle, or hip girdle. This can cause poor posture, abnormal movement of the limbs, inability to sit up, and inability to hold one's head up. Caused by damage to the motor strips of the brain.

Psycho-Social: Refers to the combined psychological and social factors. This is often used in the discussion of psychological and social factors.

Ptosis: Drooping of the upper eyelid.

Quadripareisis: A weakness that involves all four limbs.

Quadriplegia: Paralysis of the upper and lower extremities.

Recall: The act of remembering, reconstructing, and initiating that which has been stored.

Receptive Aphasia: Impaired understanding of language, whether written or spoken.

Recognition: Realizing that you have seen, heard, touched, smelled, etc. before and are connecting to that object.

Related Services/ Support Services: These terms refer to counseling for pupils and parents, speech-language services, recreation, occupational therapy, physical therapy, transportation, and any other appropriate developmental, corrective, and supportive services required for a pupil to receive education as outlined in his IEP.

Respite Care: Care provided by a professional or community agency to enable the primary caretaker an interval of rest or relief.

Retrieval: Bringing back from storage for the purpose of communication.

Retrograde Amnesia: Loss of memory for events and periods of time before the injury or accident.

Romberg's Sign: Inability to maintain balance while standing with eyes closed and feet together. Indicates cerebellar dysfunction.

Scanning Speech: Slow hesitant speech characterized by pauses between syllables.

Sciatica: Pain along the course of the sciatic nerve.

Scotoma: A blind area in the visual field.

Semicoma (Light Coma): An altered state of consciousness in which the patient responds only to painful stimuli.

Sensorium: The state of an individual in regard to his mental awareness.

Sensory Aphasia: Loss of the ability to comprehend spoken language; receptive aphasia. Caused by a lesion in Wernicke's area.

Soft Signs: Refer to minimal behavioral deviations in a child, reported by the neurologist, where the traditional neurological examination shows no clear sign of brain damage or dysfunction. These indications, such as neuromuscular clumsiness, involuntary twitching movements of the hands, and poor directional sense, are strongly suggestive of abnormal functioning of the central nervous system, but such a diagnosis is not supported by the usual neurological examination techniques. Consequently, these are suspected neurological signs.

Somnolence: Sleepiness, unusual drowsiness.

Spasm: A sudden violent, involuntary contraction of a muscle or a group of muscles.

Spastic: Abnormal increase in muscle tone.

Spasticity: An abnormal increase in muscle tone, causing the muscles to resist being stretched. A patient with "spasticity" may look curled up, with his arms held close to his chest, or he may appear stiff.

Spinothalamic Tract: Sensory pathways from the gray dorsal column of the spinal cord terminating in the thalamus.

Spontaneous Recovery: The recovery that takes place naturally as the brain heals; this type of recovery occurs with or without rehabilitation, and it is often difficult to know how much improvement is spontaneous and how much is due to rehabilitative interventions. It occurs early in the recovery process.

Sterognosis: The ability to recognize objects by touch.

Strabismus: Inability of the eyes to perform coordinated movements.

Stupor: An altered state of consciousness, in which the patient is very difficult to arouse, responds poorly to verbal stimuli.

Subluxation: A partial or incomplete dislocation.

Suprarentorial: Above the tentorium (the cerebrum).

Temporal Lobe: The lower middle part of each side of the brain, involved in receiving information from the auditory system and involved in memory.

Tentorium: The fold of the dura mater between the occipital lobes and the cerebellum. Supports the cerebrum, separates the posterior cranial fossa from the remainder of the cranial cavity.

Tic: An involuntary twitching of a muscle.

Tone: The normal degree of tension in a muscle.

Tonic: Rigid convulsive movements characterized by simultaneous contraction of opposing muscles.

Traumatic Head Injury: See acquired head injury.

Trigger Zone: Refers to a part of the face which when stimulated precipitates an attack of trigeminal neuralgia (tic douloureux).

Uncal Herniation: Herniation of the uncus through the tentorium causing compression of the oculomotor nerve and the brain stem.

Uncus: Extreme medial portion of the temporal lobe.

Upper Motor Neuron: The neuron from the motor cortex to the brain stem or anterior horn cell of the spinal cord. Its destruction results in spastic paralysis.

Vegetative State: An altered state of consciousness in which only involuntary or unconscious body functions remain intact.

Ventricles: Four cavities in the brain that are filled with cerebrospinal fluid, serving as a cushion when the brain is impacted. These cavities may enlarge when brain tissue is damaged.

Visual Field Deficit: Inability to see objects located in a specific area of the visual field. Often the blind area includes everything in either the left or the right half of the visual field, but may involve a quarter of the visual field.

Wada Carotid Amytal Test: Refers to the test of speech dominance first developed by Dr. Juhn Wada in 1949. When amytal is injected into the left carotid artery it is carried to the left cerebral hemisphere in a matter of seconds, where it has an anesthetizing effect. In most patients this produces temporary interference with all language processes. When injected into the right carotid artery amytal usually interferes with a patient's ability for picture interpretation and spatial perception.

Wernicke's Aphasia: Receptive aphasia.

Wernicke's Area: The cerebral cortical area, usually in the left temporal area, believed to be involved in the understanding of language. It is believed to include one-third of the left superior temporal gyrus and part of the middle temporal gyrus.

Glossary of Educational Terms

Advocate: A person, often a professional or trained parent, whose primary responsibility is to defend and speak for the best interest of a child.

Assessment: An observation and/or tests designed to determine a child's abilities in specific areas.

Assistive Technology: a device or item that is used to maintain or improve the functional capabilities of an individual with a disability. Examples are computer access aids, seating and positioning devices, mobility aids, electronic tools and other devices for daily living, and sensory aids.

Augmentative Communication: Assistive technology devices that enable individuals who are nonverbal or who have limited speech to communicate.

Child Study Team (CST): An interdisciplinary group of certified persons who evaluate, coordinate, provide preventive and support services to pupils, family, and general education staff. The combination of professionals on the team is determined by the youngster's specific needs, but generally includes the school psychologist, learning disabilities teacher-consultant, school social worker.

Due Process: The principle of law that ensures fair procedures will be followed during the special education of a child.

Early Intervention: Provision for implementation of programs provided to children with a handicap between birth and age three.

Educational Evaluation: A series of tests given by a learning disabilities teacher-consultant to determine a child's academic performance and learning styles.

Educational Objectives: A set of measurable skills, accomplishments or tasks for a child that are written into the IEP.

IDEA: The Individuals with Disabilities Education Act requires free and appropriate public education for students with certain learning disabilities.

IEP Team: Group of individuals, including parents, teachers, and other professionals involved with the education of a child, who develop and review the IEP.

In-Class Replacement: (Resource program option) Individualized instruction is provided in the pupil's regular class. The student is included in regular classroom activities such as discussions, special projects, field trips, etc.

In-Class Support: (Resource program option) A program of instruction where regular and special education teachers are planning and implementing special education. Instructional responsibility is shared between the two teachers as described in the student's IEP. Support instruction is at the same time and in the same activities as the rest of the class.

Inclusion: The placement of students with disabilities in general education buildings and classrooms.

Independent Evaluations: Similar to the evaluation done by the school, but given by a trained person or team employed outside the school system. You may request an independent evaluation at the expense of the school system if you are not satisfied by that done by the school. This independent evaluation must be considered in planning for your child's educational needs.

Individualized Education Program (IEP): The basic plan including an instructional guide written by the IEP team prior to the pupil's placement in a program. The plan states the pupil's eligibility for special education and related services, states current educational status, outlines goals, and describes the pupil's educational program.

Learning Disabilities Teacher-Consultant (LDTC): The LDTC completes educational evaluations and assessments and consults with teachers as necessary.

Learning Strategies: Specific approaches or methods a student uses to work on a task.

Least Restrictive Learning Environment (LRE): To the maximum extent appropriate, a student with a disability is educated with children who are not disabled. Special classes, separate schooling or other removal of a student with a disability from the student's general education class occurs only when the nature or severity of the educational disability is such that education in the student's general education class with the use of appropriate supplementary aids and services cannot be achieved satisfactorily.

Mainstreamed: When a classified student receives instruction in a regular class.

Mediation: A voluntary process available to resolve disputes between school districts and families.

Neuropsychological Evaluation: An assessment using psychological tests, interviews, and behavioral observation, to determine a person's cognitive, emotional, and behavioral status, with particular emphasis on deficiencies in intellect, personality, and behaviors as outcomes of a brain injury. Such assessments attempt to determine brain behavior relationships, location of injury and brain systems involved.

Non-Discriminatory Testing and Classification: The methods used to test must be suited to your child's condition. A professional who understands the nature and unique aspects of your child's injury should do the testing. For example, a child who writes very slowly because of difficulty holding a pencil due to a muscle or nerve problem in the hands cannot be expected to take a written test in the same time period as a child with normal hand use.

Out of District Placement: When a child attends a school program outside his home school district.

Private Placement: Placement in private school, paid for by student's home school district.

Psychological Evaluation: A series of tests given by a school psychologist to determine your child's ability to learn and his social and emotional development.

Related Services/ Support Services: These terms refer to counseling for students and parents, speech-language services, recreation, occupational therapy, physical therapy, transportation, and any other appropriate developmental, corrective, and supportive services required for a student to receive education as outlined in his IEP.

Residential Placement: Program that provides not only the required school educational setting, but also a 24 hours a day, 7 days a week living situation.

Resource Programs: A variation of in-class and out-of-class programs of specialized instruction that are organized around a single subject and that are provided to students with disabilities by an appropriately certified teacher of students with disabilities.

School Case Manager: The person on the child study team assigned to an individual student to coordinate the development, monitoring, and evaluation of the effectiveness of the IEP, as well as to facilitate communication between home and school and coordinate the annual review and evaluation process.

School Psychologist: Acts as a counselor, consultant to parents, teachers, students, and as an evaluator. When conducting an assessment, the school psychologist determines the child's intellectual ability in relation to school and social and emotional adjustment.

School Social Worker: Acts as a counselor and consultant to parents, teachers, and students. This child study team member often acts as the liaison between home and school, and provides information on community resources. The social worker assesses the student's academic, social, and developmental histories to provide background information relating to the child's education.

Social Evaluation: An evaluation of family, school, and community patterns as they may affect your child's adjustment at school, arrived at jointly by the parent and the school social worker.

Special Class Placement: Previously referred to as self-contained classroom.

Speech-Language Specialist: Is responsible for the evaluation and treatment of speech and language deficits. Treatment addresses auditory and reading comprehension, verbal and written expression, articulation, swallowing, and pragmatics (the social behaviors involved in communication). This therapist also screens and is responsible for making appropriate referrals for clients with hearing disorders.

Transition planning: The process of planning for the student's transition from adolescence to adulthood and from school to life after school. Under UDEA, this process begins when the student reaches age 14.

Vocational Counselor: Assists teenage students in evaluation and placement in appropriate future work settings. Includes formal testing and interview of interests and abilities of students.

Zero Reject: No child between the ages of 3 and 21 years can be denied an appropriate education because of a physical disability.

Statistics

According to the Center for Disease Control, in the United States,

- 5.3 million Americans (approximately 2% of the U.S. population) live with disabilities resulting from brain injuries.
- A brain injury occurs every 23 seconds in this country, and sends more than 1.4 million people to the hospital each year.
- Of this 1.4 million:
 - 235,000 will be hospitalized and survive
 - Approximately 80,000 - 90,000 will experience an onset of disabilities resulting from their brain injuries
 - 50,000 will die

Traumatic brain injury and children – national statistics

- Brain injury is the most frequent cause of disability and death among children and adolescents in the United States (CDC, 1999; Lehr, 1990).
- Males are 1.5 as likely to sustain a brain injury as females, due to differences in risk exposure and lifestyle. 14 to 24 year old males are at highest risk. (CDC, 2004)
- The leading causes of brain injury in children are falls, motor vehicle crashes and assaults (CDC, 2004).
- Among children ages 4 to 14, motor vehicle crashes with children as passengers is the number one cause of brain injury. Unrestrained or improperly restrained children of any age are much more likely to incur a brain injury and/or die in motor vehicle crashes than children that are restrained properly (National Safe Kids Campaign, 1999).
- Every two hours in the United States a child is killed with a loaded gun (American Academy of Pediatrics, 1994). In 1992, firearms surpassed motor vehicles as the number one cause of brain injury fatalities in the United States (Sosin et al., 1995).

Traumatic brain injury and children - NJ statistics

The Center for Health Statistics in New Jersey has compiled the following statistics for children ages birth -21 who were hospitalized in 2000 with a traumatic brain injury (Center for Health Statistics, July, 2004). These statistics do not include those individuals who were seen in emergency rooms and not admitted, or those who never went to the hospital at all. These numbers do not represent those with acquired brain injury.

In New Jersey,

- Males sustain approximately 75% more brain injuries compared to females. The ratio increases further when traumatic brain injury from assaults is examined, with 86% of brain injuries from assault occurring in males.
- Children in high school and post high school (ages 15-24) sustain over half of all traumatic brain injuries in the birth to 24 age group.
- Motor vehicle collisions are the cause of the largest number of brain injuries.
- Brain injuries from falls occur more often in younger children and taper off as children get older.
- Brain injuries from assaults and motor vehicle crashes occur more often in the high school and post high school years (15-21).

References

Centers for Disease Control and Prevention. *TBI in the U.S.*, October, 2004

Center for Health Statistics, Department of Health and Senior Services, *Central Nervous System Injury*, Trenton, NJ, July, 2004.

Lehr E: Incidence and Etiology. In: *Psychological Management of Traumatic Brain Injuries in Children and Adolescents*. E Lehr (Ed.) Rockville, MD: Aspen Publishers, 1990.

National Safe Kids Campaign, *Fact Sheet on Motor Vehicle Occupant Injury*. Washington, D.C, 1999.

Resources

There are many sources of information on brain injury, advocacy, special education, and many other topics addressed in this guide. The sources listed below are good places to begin searching when you need information about a specific topic. The Brain Injury Association of New Jersey's Information & Resources Helpline can provide you with additional information on available resources.

Brain Injury Association of New Jersey, Inc.

☎(800) 669-4323 (Family Helpline) ☎(732) 745-0200 Web: www.bianj.org

BIANJ provides a number of services to assist individuals with a brain injury and their families.
(See page 2 for more information)

Brain Injury Association of America (BIA)

☎(800) 444-6443 (Help Support Line) ☎(703) 761-0755 Web: www.biausa.org

BIA provides information about brain injury and resources throughout the United States. The web page provides dozens of links to brain injury information sites.

Statewide Parent Advocacy Network (SPAN)

☎(800) 654-7726 Web: www.spannj.org

SPAN provides information, training, and advocacy for parents of children with disabilities.

New Jersey Protection and Advocacy

☎(800) 922-7233 Web: www.njpanda.org

This program protects and advocates for the rights of citizens with disabilities.

Education Law Center

☎(973) 624-1815 Web: www.edlawcenter.org

This agency provides help for families with issues related to the education system.

Community Health Law Project

☎(609) 392-5553 Web: www.chlp.org

This project advocates for the health care needs of individuals with disabilities.

Association of Schools and Agencies for the Handicapped-New Jersey

☎(877) 287-2724 Web: www.asah.org

This organization provides information about private schools in NJ, which provide specialized services for students with special needs.

Families and Advocates Partnership for Education (FAPE)

☎(952) 838-9000 Toll-free: ☎(888) 248-0822 Web: www.fape.org

The Families and Advocates Partnership for Education (FAPE) project is a partnership that links families, advocates, and self-advocates to information about the Individuals with Disabilities Education Act (IDEA).

HEATH Resource Center

Toll-free: ☎(800) 544-3284 Web: www.heath.gwu.edu

A resource center of the George Washington University, Graduate School of Education and Human Development, and the national clearinghouse on postsecondary education for individuals with disabilities.

Family Support Center of New Jersey

Toll-free: ☎1-800-372-6510 Web: www.fscnj.org

The Family Support Center is a "One-Stop Shop" clearinghouse, offering the most up-to-date information on all types of disabilities as well as national, state and local support programs and services for individuals and families seeking such information.

Lash & Associates Publishing/Training Inc.

708 Young Forest Drive, Wake Forest, NC 27587-9040

☎(919) 562-0015 Web: www.lapublishing.com

This company has a comprehensive array of written materials and resources about brain injury.

National Information Center on Children and Youth with Disabilities

PO Box 1492, Washington, DC 20013-1492

☎(800) 695-0285, ☎(202) 884-8200 Web: www.nichcy.org

Clearinghouse with a large selection of clearly written, free or low-cost information.

National Safe Kids Campaign

1301 Pennsylvania Ave., NW Suite 1000, Washington, D.C. 20004-1707

☎(202) 662-0600 Web: www.safekids.org

SOME NJ GOVERNMENT AGENCIES/PROGRAMS

Office of Special Education Programs

☎(609) 292-0147

Web: www.state.nj.us/njded/specialed

This state office is responsible for providing special education and related services.

Learning Resource Centers

Web: <http://www.nj.gov/njded/lrc/>

The Learning Resource Centers are supported through the New Jersey State Department of Education, Office of Special Education Programs and provide services to parents and educators serving pupils with disabilities ages 3 to 21, including information services, books and videos that can be borrowed, and consultation and training services.

Division of Disability Services

Toll free Information Line ☎(888) 285-3036

Web: www.state.nj.us/health/dds/index.html

The Division of Disability Services is an excellent resource for disability-related information, and also oversees the Traumatic Brain Injury Fund and Traumatic Brain Injury Medicaid Waiver. Call for a free resource guide.

Division of Developmental Disabilities

☎(609) 292-7260

Web: www.state.nj.us/humanservices/ddd/index.html

This organization provides services for households that include an individual with a developmental disability or brain injury sustained before the age of 21.

Division of Child Behavioral Health Services (DCBHS)

24-hour Access Line: ☎1-877-652-7624

Web: www.state.nj.us/humanservices/dcbhs/aboutdcbhs.htm

The Division of Child Behavioral Health Services (DCBHS), serves children and adolescents with emotional and behavioral health care challenges and their families across all child-serving systems.

Division of Vocational Rehabilitation Services

☎(609) 292-2919

Web: www.state.nj.us/labor/dvrs/vrsindex.html

DVRS provides services to individuals with work-related disabilities to help those individuals become employed.

Commission for the Blind and Visually Impaired

☎(973) 648-2324

Web: www.state.nj.us/humanservices/cbvi/index.html

This program provides vocational rehabilitation services for people who are blind or visually impaired.

New Jersey Traumatic Brain Injury (TBI) Medicaid Waiver Program

☎(888) 285-3036

Web: www.state.nj.us/health/dds/index.html

This program provides services in the home and community for those injured after the age of 21 who qualify financially and medically.

New Jersey Traumatic Brain Injury (TBI) Fund

☎(888) 285-3036

Web: www.state.nj.us/health/dds/index.html

The Traumatic Brain Injury Fund, administered by the Division of Disability Services, allows New Jersey residents who have survived an acquired brain injury to obtain the services and supports they need to live in the community.

Special Child, Adult and Early Intervention Services

☎Telephone: 609-777-7778

Web: www.state.nj.us/health/fhs/scdesc.htm

Special Child Health Services provides case management to ensure that children with special health care needs receive quality services that will prevent or reduce the effects of developmental delay, chronic illness or behavioral disorder.

Catastrophic Illness in Children Relief Fund

Toll Free: ☎1-800-335-FUND

Web: www.njcatastrophicfund.org

Financial help is available from this fund if your child is 21 years old or younger when the medical expenses were incurred; your family has lived in New Jersey at least three months prior to application; and in any prior, consecutive, 12 month period, dating back to 1988, eligible expenses must exceed 10% of the family's income, plus 15% of any excess income over \$100,000. Covered expenses include, but are not limited to, special ambulatory care, acute or specialized in- or out-patient hospital care, medical equipment, medically-related home modifications, home health care and medical transportation.

NJ Family Care

Toll Free: ☎(800) 701-0710

Web: www.njfamilycare.org

NJ FamilyCare is a federal and state funded health insurance program created to help New Jersey's uninsured children and certain low-income parents and guardians to have affordable health coverage.

BIANJ Publications

The Brain Injury Association of New Jersey provides a number of free publications for families and professionals, all of which can be obtained by calling the Association at 1-800-669-4323 or (732) 745-0200. Publications can also be ordered online at www.bianj.org. The following are just a few of the publications available through the Association.

Brain Injury: A Guide for Educators - This booklet assists all educators in working with children with brain injury.

Brain Injury: A Guide for Families about School - This booklet is geared for family members to assist with their child's transition back to school following a brain injury.

Brain Injury: A Guide for School Nurses - This booklet assists school nurses in understanding the unique needs of children with brain injury.

Acute Brain Injury: A guide for family and friends

This booklet provides basic information about brain injury and its treatment. It describes the brain, how it functions, and what happens when it is hurt in clear terms. It is especially useful for understanding medical care and rehabilitation in the early stages of recovery. It has a helpful section of NJ resources. Also available in a Spanish translation.

Brain Injury, When the Call Comes: A Congregational Resource

This 24-page booklet provides clergy with information about brain injury, how it impacts the person, family and community, and how the congregation can help.

Browse & Borrow Book & Video Catalog

The Association maintains a library of over 200 books and 40 videos that New Jersey residents can borrow free of charge. This catalog lists all books and videos available, complete with descriptions and borrow forms.

Making Life Work After Brain Injury: A Family Guide for Life at Home

This book will help readers' families, persons with brain injury and professionals -- through the new, uncharted territory of brain injury -- physical, cognitive and behavioral symptoms -- including answers to questions family members commonly ask.

New Jersey Brain Injury Resource Guide

This 20-page booklet contains information on brain injury resources around the state, including support groups, rehabilitation programs, national and state brain injury associations, and state and county organizations and agencies that assist people with brain injuries.

Traumatic Brain Injury & NJ Special Education

This fact sheet assists families in understanding Traumatic Brain Injury as it is defined within the NJ Special Education system, along with symptoms and statistics related to children and brain injury.

When Your Child's Head Has Been Hurt (available in English and Spanish)

This colorful flyer describes what parents should look out for following their child's mild brain injury and how to get help.

Brain Injury Prevention Materials

The Association also provides a number of materials to raise awareness of the preventability of brain injury, including fact sheets, posters, coloring books and brochures.

Books & Videos

It can be difficult to find information that is practical and understandable. The following books and videos are clearly written for families and educators and are helpful for understanding brain injury and special education. All books and videos are available through the Brain Injury Association of New Jersey's Browse & Borrow Book & Video Library, and can be borrowed free of charge. A complete listing of books and videos available to be borrowed through the Association is available by calling 1-800-669-4323 or (732)-745-0200. A complete listing is also available online at www.bianj.org.

Children with Traumatic Brain Injury: A Parents' Guide

Edited by Lisa Schoenbrodt

Published in 2001 by Woodbine House in Bethesda, MD

☎800-843-7323

Web: www.woodbinehouse.com

A comprehensive reference book written by a multidisciplinary team of professionals, this book provides parents with medical, rehabilitation, educational and legal information and support to help them and their child navigate through brain injury.

Pediatric Brain Injury: The special case of the very young child

Written by Carole Wedel Sellars, Candace Hill Vegter, Susan Sivertsen Ellerbusch

Published in 1997 by HDI Publishers, PO Box 131401, Houston, TX 77219 ☎(800) 321-7037

Using an exceptionally concise, clear and understandable writing style, the authors give an excellent overview of the effects of brain injuries on infants, toddlers and preschoolers. Remarkably free of complex medical jargon, it reviews the development of the child's young brain, compares normal development with changes that can result from a brain injury, and gives case studies. The challenge of designing therapy programs for young children is explained fully to help parents understand goals and treatment principles.

A Manual for Managing Special Education for Students with Brain Injury

Written by Marilyn Lash, Bob Cluett

Published in 1999 by Lash and Associates Publishing/Training, Inc.

708 Young Forest Drive, Wake Forest, NC 27587 ☎(919) 562-0015 Web: www.lapublishing.com

Skills used by professional case managers are adapted for parents and applied to special education. They are...

Assessment... How has the brain injury affected this child?

Information gathering... What do I need to know?

Referral... When do I involve a specialist?

Service Coordination... How do I put this all together?

Advocacy... How can I help others understand?

Evaluation... How do I know if this is working?

An Educational Challenge: Meeting the needs of students with brain injury

Written by Dana DeBoskey

Published in 1996 by HDI Publishers, PO Box 131401, Houston, TX 77219 ☎(800) 321-7037

This manual gives a basic overview with a lot of information about the brain and how it works in very clear, non-jargon writing that is readily understandable for educators and parents. Common cognitive needs are described with lists for interventions and strategies in the classroom. Types of assessment batteries and achievement tests used by schools are listed. Final chapters address the often overlooked topics of teacher reactions and vocational planning.

Signs and Strategies for Educating Students with Brain Injuries

Written by Marilyn Lash, Gary Wolcott and Sue Pearson

Second edition published in 2001 by Lash and Associates Publishing/Training, Inc.,

708 Young Forest Drive, Wake Forest, NC 27587 ☎(919) 562-0015

This book gives a basic overview of the consequences that brain injuries can have on a child's learning, behavior and adjustment in school. It explains common changes and gives strategies for the classroom and at home. A special section on transition strategies helps prepare the student for moving from teacher to teacher, grade to grade and school to school with lots of worksheets for families and educators.

Brain Injury and the Schools: A Guide for Educators

Written by Anne McDonnell

Published in 2005 by the Brain Injury Association of Virginia

☎(804) 355-5748

Web: www.biaav.net

This manual provides an overview of brain injury and its cognitive, behavioral, and physical consequences. It provides many resources for teaching and non-teaching personnel: strategies for addressing the issues these students may have relative to education and transition and where to find additional information. This manual was written for school personnel (regular and special education teachers) instructional assistants, psychologists, social workers, and school nurses.

Educating Educators about Acquired Brain Injury

Produced by Brock University and the Ontario Brain Injury Association in 2003

E-Mail: obia@obia.on.ca

Web: www.abieducation.com

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. This manual covers topics such as brain and function in the context of ABI, understanding ABI from a developmental perspective, working with ABI in the school, teach approach and assessment and the role of parents. An appendix is included which has acronyms, a brain injury quiz, glossary and resource/reference list.

Learning and Cognitive Communication Challenges: Developing Educational Programs for Students with Brain Injuries

Written by Roberta DePompei & Janet Tyler

Second edition published in 2004 by Lash and Associates Publishing/Training, Inc.,

708 Young Forest Drive, Wake Forest, NC 27587 ☎ (919) 562-0015

This manual explains the relationship between cognitive processes and classroom behavior. By understanding the effects of these challenges on learning and behavior in the classroom, educators and therapists can develop more effective educational strategies and accommodations. Written in clear language and filled with practical checklists and student examples, this user-friendly manual expands on the already popular educational tip cards by the authors. Chapters Address: cognitive-communicative challenges, effect of cognitive-communicative challenges on learning and behavior in the classroom, treatment of cognitive-communicative strengths and needs using an integrative approach, assessing teaching strategies, and transitioning students with brain injuries.

Returning to School Following Brain Injury: A Guide for School Personnel

Produced in 1993 by the National Resource Center for Traumatic Brain Injury

Web: www.neuro.pmr.vcu.edu/material/2005catalog/index.htm

This video will help family members, counselors, and teachers more effectively advocate for students with brain injury. This insightful three-part, 60-minute videotape addresses the causes and consequences of TBI, eligibility requirements and curriculum considerations, and classroom strategies for promoting academic success following traumatic brain injury. Professionals, survivors of TBI, their family members, and students help educators understand the need for family-educator-professional partnerships in preparing the student with TBI for his/her return to the school setting. Topics highlighted include: effective educational programming and individual educational plans, common obstacles to learning and recommended action steps, environmental adaptations and special education services, and placement options.

TAKE TWO After Traumatic Brain Injury

Produced in 2001 by Project BRAIN, Tennessee Disability Coalition

Available through Lash and Associates Publishing/Training, Inc.,

708 Young Forest Drive, Wake Forest, NC 27587 ☎ (919) 562-0015

Three families openly discuss the effects of traumatic brain injury. The youths talk about the physical and cognitive changes that altered their abilities in school, relationships with others, and plan for the future. Professionals in rehabilitation, mental health and education, comment on the challenges typically faced by families when a child has a brain injury. This video shows the educational challenges by following these three youths as they return to school. It describes the strategies and supports that helped them return to the classroom and resume their education. Their wide age span demonstrates the developmental impact of a brain injury and the different educational issues in elementary and high school.

Pathways to Successful Transition for Youth with Disabilities

Written by Gary Greene and Carol A. Kochhar-Bryant

Published in 2003 by Pearson Education, Inc.

The goal of this book is to provide the reader with an understanding of the possibilities and potential of transition services, as well as philosophy and practices for the benefit of students with disabilities. In this book, the authors present prevailing as well as contrary views on transition, then emphasize those that are held by the majority of researchers and practitioners. This book is not intended to be an encyclopedia or exhaustive review of transition research and services, but rather an overview of those areas in which there is agreement on principles and where controversy is based on easily understood differences in reasons or opinion.

Further Reading

The Brain Injury Association of New Jersey maintains both an online library of articles, many of which are clearly written for families and educators. The following articles are available at www.bianj.org.

Questions Often Asked About Behavior After Brain Injury by Marilyn Lash, MSW and Ronald Savage, EdD. TBI Challenge! (Vol. 4, No. 4, 2000).

Questions About Speech and Communication After Brain Injury by Marilyn Lash, MSW and Roberta DePompeii, PhD. TBI Challenge! (Vol. 4, No. 4, 2000).

Brothers and Sisters: Brain Injury is a Family Affair by Carolyn Rocchio. Family News and Views.

Helping Brothers and Sisters by Marilyn Lash, MSW. TBI Challenge! (Vol. 3, No. 4, 1999).

School to Work: Moving From Adolescence to Adulthood by Marilyn Lash, MSW. TBI Challenge (Vol. 4, No. 1, 2000).

Back To School by Marilyn Lash, MSW and Bob Cluett. TBI Challenge! (Vol. 3, No. 5, 1999).

Learning About Special Education by Marilyn Lash, MSW and Bob Cluett. TBI Challenge! (Vol. 3, No. 2, 1999).

Teaching Accommodations for Students with Brain Injuries by Marilyn Lash, MSW. TBI Challenge! (Vol. 4, No. 2, 2000).

Testing Accommodations for Students with Disabilities by Jill Adams. TBI Challenge! (Vol. 4, No. 1, 2000).

Young Adults with Brain Injury and College by Jen Bunch. TBI Challenge! (Vol. 4, No. 2, 2000).

The following are articles that can be obtained by contacting the Brain Injury Association of New Jersey or can be downloaded online from the cited website.

Students with Traumatic Brain Injury: Identification, Assessment and Classroom Accommodations by Mary Hibbard, Wayne A. Gordon, Tamar Martin, Barry Raskin, Margaret Brown. Premier Outlook (Vol. 3, Issue 3, Summer 2002). Available online at www.premier-outlook.com.

School Integration: Addressing Behavioral Needs of Students Following Brain Injury by Janice Opella, M.Ed. Premier Outlook (Vol. 4, Issue 2, Summer 2004). Available online at www.premier-outlook.com.

Student with a Brain Injury: Achieving Goals for Higher Education by HEATH Resource Center. Available online at www.heath.gwu.edu.

Additional articles for families and educators are available in hard copy from the Brain Injury Association of New Jersey on a range of topics. For more information, contact one of the Association's Information & Resource Specialists at 1-800-669-4323 or (732)-745-0200.

Please Give Us Your feedback

BIANJ needs your help! Your feedback is essential to our ongoing development of information and resources about brain injury. Please take a moment to help us evaluate this guide. When finished, please cut and fold this page in thirds, affix first class stamp, tape shut and mail.

Thank you.

Brain Injury: A Guide for Educators

Where did you receive or hear about this guide? _____

Was the information provided helpful?

- Very helpful Somewhat helpful
 Not helpful No opinion

I am (please check)

- A person with a brain injury A family member/friend
 A professional _____
 Other _____

Comments _____

Out of State Order Form

Name _____ Title _____
 Organization _____
 Address _____
 City _____ State _____ Zip _____
 Tel: (____) _____ Fax: (____) _____

Item	Quantities	Totals
Brain Injury: A Guide for Educators		
<input type="checkbox"/> 1 copy @ \$7.00 each	<input type="checkbox"/> 2 or more copies @ \$6.50 each	Qty: _____ \$ _____
Brain Injury: A Guide for School Nurses		
<input type="checkbox"/> 1 copy @ \$6.00 each	<input type="checkbox"/> 2 or more copies @ \$5.50 each	Qty: _____ \$ _____
Brain Injury: A Guide for Families About School		
<input type="checkbox"/> 1 or more copies @ \$5.00 each		Qty: _____ \$ _____
		SubTotal \$ _____
		Total \$ _____

Payment method

Check enclosed PO enclosed Bill me
 Please charge my: Visa MasterCard
 Card # _____ Exp date _____
 Signature _____

Make check payable and mail to:

Brain Injury Association of New Jersey, Inc., 825 Georges Road • 2nd Floor • North Brunswick, NJ 08902

The printing of this guide is made possible through the New Jersey Traumatic Brain Injury Fund, administered by the New Jersey Department of Human Services, Division of Disability Services.



Brain Injury Association of New Jersey, Inc.

825 Georges Road • 2nd Floor • North Brunswick, NJ 08902 • (732)-745-0200