Brain Injury:
A Guide for Educators

Brain Injury Alliance
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This publication was developed by the Children and Adolescents Committee of the Brain Injury Alliance of New Jersey (BIANJ), and adapted, with permission, by the Brain Injury Alliance of Connecticut.

Lead writers:
Jill Harris, Ph.D., Children's Specialized Hospital
Lois Mishkin, M.A., C.C.C./L.D.T.C., Lois Mishkin Associates, Inc.
Brad Ross, Ph.D., Children's Specialized Hospital

Other group contributors included:
Jill Brooks, Ph.D., Head to Head Consultants
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, Retired
Bonnie Merkel, M.A., NJ Department of Education, Retired
Susan Paradise, M.Ed., JFK Rehabilitation Institute
Ron Savage, Ed.D., Private Practice
Sue Stephens, M.S.W., Cancer Institue, Robert Wood Johnson
Judith Woop, M.Ed., R.N., NJ State School Nurses Association **Donna Bogart, Ed.D.**, NJ Department of Education

Edited by:
Marilyn Lash, M.S.W.
&
Members of the Children and Adolescents Committee

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Brain Injury Alliance of Connecticut
200 Day Hill Road • Suite 250 • Windsor, CT 06095
Phone: 860-219-0291 • Family Helpline: (800) 278-8242
Email: general@biact.org • Web: www.biactj.org

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Introduction

Members of the Children and Adolescents Committee, formerly known as the Education System Advisory Group, of the Brain Injury Alliance of New Jersey (BIANJ) wrote this guide to help educators identify, understand and respond to the special needs of students with brain injuries. The writers and members of the Committee include professionals who work in the field of brain injury, cognitive rehabilitation, general and special education, school nursing and parents. The guide was adapted, with permission, by the Brain Injury Alliance of Connecticut.

This guide is written for general and special education teachers, school psychologists, educational consultants, social workers, guidance counselors, principals, speech and language pathologists and other professionals who work with students with brain injuries. The term educators is used broadly in this guide to include the wide array of school staff, who all share the common goal of education. They each influence a student's experiences and accomplishments in school.

The contents include information about brain injury, including:

- types and causes of brain injury
- consequences of brain injuries
- anatomy of the brain
- school reentry
- assessment and teaching strategies
- Individualized Educational Program (IEP) development
- program planning and implementation
- transition to adulthood

Many educators have little training about brain injury since few courses or training programs on this topic currently exist. This guide provides a foundation to train all educators. With this material, educators will gain an increased awareness and understanding of students with brain injuries and their families. With an increase in the identification of students with brain injuries in schools, educators become vital resources for students, colleagues and families. This guide will help educators understand the unique characteristics that make this a challenging and interesting population.

Brain Injury Alliance of Connecticut (BIAC)

Our Mission
The Brain Injury Alliance of Connecticut is Connecticut's partner in brain injury prevention and recovery.

BIAC offers the following programs and services in support of brain injury survivors, their families and caregivers, professionals and the community: To learn more about BIAC's free programs and services, visit www.biact.org or call 860.219.0291.

- **Information & Resources Helpline**
  Brain injury specialists provide support and resources for more than 4,000 inquiries from survivors, caregivers and professionals each year to ensure that the often complex and overwhelming challenges they face are negotiated more easily and effectively. Contacts are made through BIAC's toll-free Helpline, email, social media and individual in-person consultations.

- **Outreach & Education**
  Through its Prevention & Education Programs, BIAC works to increase awareness and understanding of brain injury and its prevention through school, professional and community presentations. BIAC's Annual Conference is Connecticut's premiere brain injury education program, drawing more than 275 professionals each year to learn the latest developments in the field.

- **Support Groups & Social Events**
  BIAC sponsors numerous support groups throughout Connecticut that provide information, support and encouragement to survivors, their loved ones and caregivers, while offering social events and opportunities such as picnics and our Valentine's Day Dance.

- **Legislative Advocacy**
  BIAC advocates for legislation to improve the quality of life for people living with brain injuries while supporting initiatives that help to prevent brain injuries from occurring.

Chapter 1
What is Brain Injury?

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

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 occur during everyday activities. Among young children, the most common causes are falls, such as a fall from a changing table or down the stairs in a walker Tragically, physical abuse by hitting or shaking a child is another major cause in young children. Car crashes, where the child is a passenger or is struck by a car, are major causes of brain injury among all ages. Falls or collisions while skate boarding, roller blading or biking, as well as sports injuries, are common causes of brain injuries in elementary school age children and adolescents.

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

Acquired brain injuries are caused by some medical conditions, including strokes, encephalitis, aneurysms, anoxia (lack of oxygen during surgery, drug overdose, or near drowning), metabolic disorders, meningitis, or brain tumors.

Although the causes of brain injury differ, the effects of these injuries on a child's life are quite similar. This guide uses the general term of "brain injury" to include children with traumatic and acquired brain injuries. The term "traumatic brain injury" (TBI) is used when information is specific to those injuries.

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 2.8 million people in the United States have traumatic brain injuries each year, but only one tenth of them are admitted to hospitals. This number does not include 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. This means that many children and their families are not aware that a child with a brain injury may need special attention. Family members, school personnel, and even medical professionals

may have trouble figuring out why a child's behavior or abilities have changed when symptoms finally appear.

Often what is really a brain injury is diagnosed as a behavioral or learning problem. Thus, the "silent epidemic" includes thousands of undiagnosed brain injuries.

Brain injury is also "silent" because most children with brain injuries look "normal". Some difficulties may not become apparent until the student reaches a developmental stage requiring more complex abilities. It is then that impairments from an earlier brain injury become evident. This may occur with new learning or when higher level executive functioning is required. As a child tries to learn new and more complex information in school, or make complicated and important moral decisions, difficulties may appear over time, even years after the injury.

Previously, individuals with brain injuries often did not survive. The advent of new medical technologies has greatly increased survival rates. Increasingly, even children with severe brain injuries eventually return home and go to school. By better understanding their needs, educators can help them improve not only their learning, but also their social and emotional functioning. The ability of educators and other professionals to identify, assess and educate these students has a critical impact upon their lives.

It is likely that most educators will encounter students with brain injuries at some time. The educational system is responsible for identifying, assessing, and teaching students with brain injuries. Because no two students with brain injuries present the same profile, they are a challenge for everyone involved. By helping these students to use their strengths, compensate for their weaknesses, and develop new skills, educators can enhance their independence and productivity. Even though these students are unique, some aspects of the educational planning and strategies discussed in this guide are applicable to other students with special needs.

Epidemiology

Traumatic Brain Injury

According to the Centers for Disease Control and Prevention (CDC), an estimated 5.3 million Americans, a little more than 2% of the US population, currently live with disabilities resulting from traumatic brain injuries. Additional statistics about traumatic brain injury can be found in the final section of this guide.

Acquired Brain Injury

The incidence and prevalence of various types of acquired brain injuries that may be seen in children are as follows:

Tumors

Brain tumors of the central nervous system account for nearly 20% of pediatric cancers. This is much higher than in adults, where they constitute only 1% to 2% of new cancers. No pattern of inheritance is found in most cases. Survival rates depend on the type of tumor and its location.

The survival of children with brain tumors has increased with the advent of improved imaging that provides earlier and more precise diagnosis and location of a tumor, new surgical techniques such as stereotactic surgery, and new chemotherapy agents, and radiation protocols. The fact that children are living longer after the diagnosis of a brain tumor also results in more children with acquired neurocognitive and behavioral deficits as the result of the tumor and/or treatment.

Encephalitis
Encephalitis is an inflammation of the brain and spinal cord usually caused by viral infection that presents as diffuse and/or focal neuropsychological dysfunction. In the US, determining the true incidence is impossible because reporting policies are neither standardized nor rigorously enforced. Several thousand cases of viral encephalitis are reported yearly to the CDC. This is probably a fraction of the actual number of cases.

Lead poisoning
According to the CDC, approximately 500,000 children living ages 1-5 years in the US have lead levels in their blood that are high enough to cause irreversible damage to their health. Even low lead levels are harmful and associated with decreased intelligence, impaired neurobehavioral development, decreased stature and growth, and impaired hearing acuity.

Stroke
Stroke is more rare in children than older adults. However, certain groups of children are at risk. Approximately 10% of all children with sickle cell anemia will have a stroke. Sickle cell disease affects one of every 365 African American newborns. There are approximately 100,000 persons with sickle cell disease in the US.

Severity of traumatic brain injury

Traumatic brain injuries are characterized as **mild**, **moderate**, and **severe**. Although definitions vary, the following guidelines describe these terms which are often used in medical reports.

Mild brain injury:
Brief (less than 1 hour) or no loss of consciousness (LOC) Possible symptoms of a concussion

Moderate brain injury:
Coma lasting 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 brain injury:
Coma lasting more than 24 hours

Rating scales used with brain injury

The Glasgow Coma Scale and the Rancho Los Amigos Scale of Cognitive Functioning are two scales commonly used to assess a patient's responses and functioning levels. These scales are typically used to assess traumatic brain injury, but have been applied in other types of acquired brain injuries. Both of these are widely used and referred to in many reports.

The Glasgow Coma Scale assesses the severity of injury within the first 24 hours after a brain injury. It develops a score by testing eye, motor, and verbal responses. 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 back section of this guide. There is an adapted scale for children below 4 years of age and another for those 4 years and older.

The Rancho Los Amigos Scale of Cognitive Functioning is used during rehabilitation to categorize recovery of cognitive and behavioral functioning. This scale is valuable in planning treatment programs and determining progress. The Rancho Los Amigos Scale is also in the back section of this guide to help educators understand rehabilitation records of students as they return to school.

Mild brain injury

Mild brain injuries occur much more often than moderate or severe injuries, and these students are more likely to be placed in a less restrictive environment such as the general education classroom. Sometimes children who sustain more severe injuries are not able to return to their original schools.

Neurophysiological tests can confirm organic brain damage when there is a moderate or severe brain injury. This helps identify those students. However, when the injury is a "mild" one (also referred to as a mild brain injury or concussion), there is often no such identification. There is usually no hospitalization, and, if any neurological testing was done, the results are often negative. The student and family are often told that there is "no problem" and there is no reason for further testing.

A mild brain injury is defined as a brain injury in which there is brief loss of consciousness of less than one hour or none at all. This definition varies among professionals, but the commonality is no experience of coma.

Many children have blows to the head in the course of their normal play and development. While the majority of these do not result in any lasting effects, there is evidence that a mild concussion can result in cognitive and behavioral changes. The persistence of cognitive and physical complaints and sometimes, behavioral changes, is a direct consequence of organic brain damage despite the mild degree of injury.

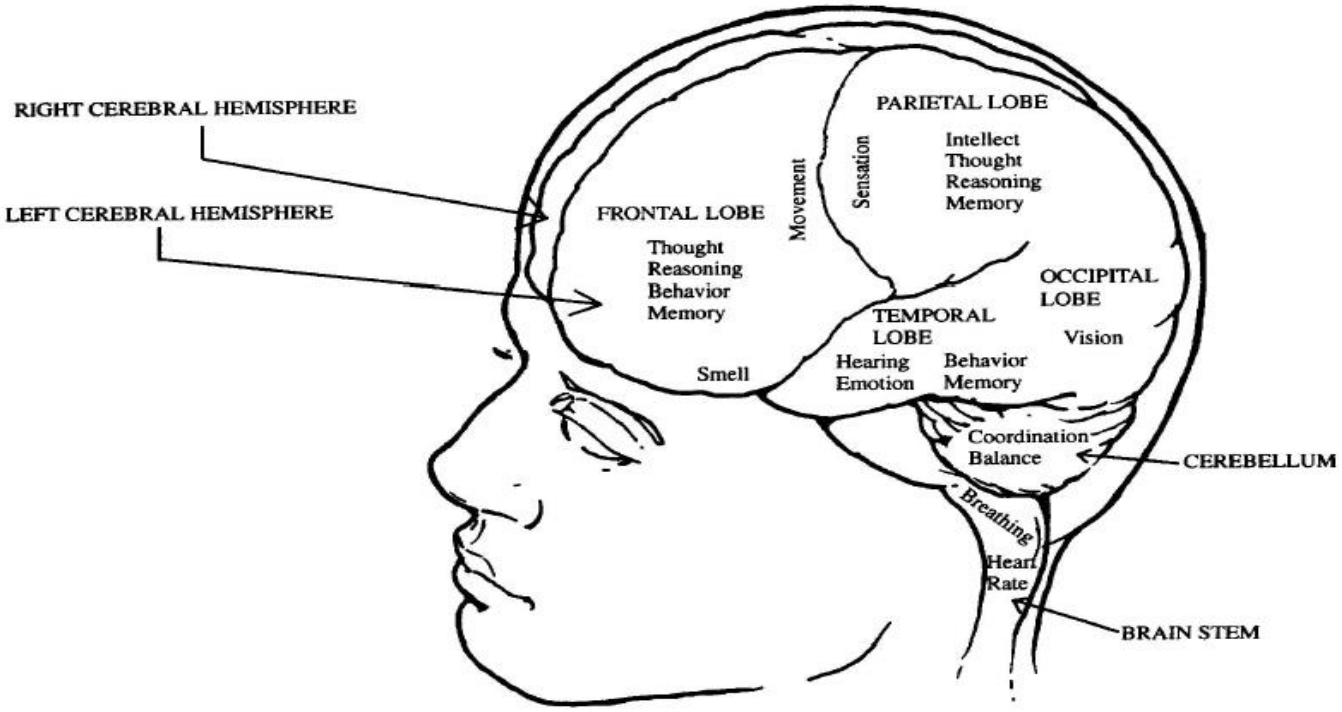
In most cases, students are told to rest, take medication for headaches, and return to school within a few days. Upon returning to school, students may not complain of any cognitive changes. However, they may have decreased school performance and increased behavioral problems that did not exist prior to the injury. The student may complain of headaches, dizziness, problems with processing language, memory problems, concentration difficulties, and poor judgment after a concussion. These can affect classroom work and relationships.

Recovery or progress after a mild brain injury can be hindered by preexisting conditions that include: learning disabilities, personality disorders, substance abuse, impulsivity, and attention deficit disorders. These conditions are likely to alter outcomes for a student with any degree of brain injury.

The teacher is often the first person to notice changes in a student that may be the result of a mild brain injury. The next critical step is to communicate this information to the family and support systems within the school. The family can then begin retracing events that led to these changes.

Anatomy of the Brain

Some general knowledge about the anatomy of the brain can enhance understanding of the student's behavior and challenges as they relate to the site of injury. Each area of the brain has specific functions, although many areas overlap. The following chart provides a summary of primary areas of the brain and how each affects cognitive, behavioral, and motor abilities.



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

Region	Functions
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 overall gestalt
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

What happens after a brain injury?

The path of treatment and rehabilitation for a student with a moderate to severe brain injury usually begins with the emergency department and often moves to inpatient care at a local hospital or trauma center. This may be followed by transfer to an inpatient rehabilitation hospital and then to outpatient rehabilitation when the student finally returns home. A typical day in the rehabilitation hospital includes cognitive, speech/language, physical, and occupational therapies, plus psychosocial support services.

Some inpatient rehabilitation programs have a hospital-based school program with a special education teacher. This is sometimes the first academic experience that the student has following a brain injury and it serves as a baseline for cognitive and academic functioning. In many cases, especially with mild brain injury, the student returns home from the hospital, or is never admitted at all, and goes back to school without any rehabilitation.

For those students who have been hospitalized and are now living at home again, rehabilitation therapies may still be needed. Just when the student needs to take it easy, there are multiple demands to catch up in school, do homework, and attend out-patient therapies or do a home therapy program. These students can end up having a longer day with greater demands than they did prior to their injury!

Brain injury is complex and unique. The road to recovery is a long process. The initial return to school is just the beginning. Educators are critical players and resources on this journey as it continues over time.

With rehabilitation and the support of family, friends and the community, many students with brain injuries are able to resume pre-injury activities. Recovery may take weeks, months, or years. Often recovery is slow and incomplete. Factors that affect recovery are:

- age when injured
- time lapsed since the injury
- length of coma, if any, and presence of post traumatic amnesia
- personality characteristics prior to injury
- intellectual and functional levels prior to injury
- cause, location, and severity of injury
- support systems
- environment and treatment since the injury
- overall medical health

Chapter 2
Consequences of Brain Injury

A brain injury has many effects on the physical, cognitive, and psychosocial well-being of a student. Many of these overlap and affect school performance. The following are some common changes following a brain injury.

Physical changes

Brain injury frequently affects sensory-motor functioning, which can significantly alter school performance. While vision and hearing normally are evaluated during rehabilitation care, it is important to reassess both during the first year post injury. Also, since many children return home directly from the hospital and do not enter rehabilitation programs, or are not hospitalized at all, these conditions may not be identified until difficulties appear in school. Early identification of these problems is important as the child returns to school. Some of the more commonly found sensory-motor difficulties are:

Vision

- Nerve damage (partial/total loss)
- Field cuts
- Double vision

Hearing

- Nerve damage (partial/total loss)
- Middle and inner ear damage
- Conductive and sensory-neural or mixed hearing loss.

Increased fatigue

Fatigue greatly affects the length of school day that the student is able to handle when returning to school. Accommodations are often necessary, such as scheduling heavier content courses during the morning or at a time that best suits the student's tolerance level. Other helpful changes are a shorter school day, or a rest period or nap.

Headaches

These are very common during the first year following an injury. They are generally treated with over-the-counter medications and monitored by a doctor for possible neurological changes. Intermittent dizziness may accompany headaches.

Seizures

Seizures occur more often just after the initial injury and during early stages of hospitalization. If seizures occur, prophylactic anti-seizure medications are given. After a child is seizure free, these medications often are discontinued because of side effects that slow cognitive processing. As with other students with seizures from other causes, anti-convulsant medication can affect concentration and cognition.

Motor deficits
Common problems after a brain injury include poor muscle coordination, unilateral or bilateral weakness or paralysis, spasticity, involuntary movement, and apraxia (impaired ability to carry out goal directed acts in the absence of paralysis or paresis).

Cognitive issues

Cognitive changes are common in students following brain injuries. They can profoundly affect educational and social functioning. Even a student with a mild brain injury, who did not lose consciousness and had negative findings on an EEG and/or CT scan, may complain of decreased memory, word-finding difficulties and slowed processing.

Attention and concentration
Impairments in sustaining attention and concentration are among the most common changes in cognitive functioning. They range from the inability to attend to a specific task for more than a few minutes to more prolonged difficulties, such as concentrating during a lecture. These problems disrupt academic functioning and may warrant individualized teaching and/or “cognitive breaks” during the day. If attention and/or concentration difficulties existed before the injury, they are likely to be more pronounced after the injury.

Communication skills
Communication deficits involve problems with both receptive and expressive language skills. Reducing the amount of information given, altering the complexity of information, and slowing the rate of presentation helps a student overcome these weaknesses. Expressive language difficulties are often demonstrated in weak organization of thought, difficulty staying on topic, and finding the right word to use on command. Written language reflects all these deficits and is often weaker than pre-injury levels.

Rate of processing information
When the rate of processing visual and/or auditory information is reduced, the student is able to grasp only part of what has been presented. This affects all aspects of processing information whether it involves listening to a teacher, watching a slide show, or interacting with peers. The result is often misunderstanding, confusion, and subsequent inappropriate comments by the student.

Organization
Problems with organization interfere with the ability to learn and remember information. Students may have difficulty organizing their homework and managing time.

Memory
Memory loss is very common. Mild brain injuries can result in short-term memory deficits, while moderate and severe injuries can cause both short-term and long-term memory deficits. Memory is often decreased after a brain injury since attention, concentration and organizational skills are usually affected. This results in difficulty learning new material, retaining it, and being able to retrieve information upon command. For example, a student may need many repetitions of material before grasping a concept, forget the information a day later, or not be able to recall information spontaneously. Yet this student may still demonstrate knowledge of the material on a multiple choice test.

In addition to cognitive deficits that directly affect academic performance, brain injuries can also alter behavioral and emotional functioning in the classroom. The most frequent behaviors that can impact academic functioning are irritability, hostility, aggression, disinhibition (decreased emotional control such as sudden crying), poor insight into problems, apathy, depression, poor judgment, and mood swings. Neurophysiological damage can also interfere with sleep, which further affects the ability to function in the classroom.

Executive functioning
Executive functioning affects a student's ability to work in a systematic and orderly manner. Difficulties in executive functioning result in impaired reasoning, abstract thinking, problem solving, and simultaneous processing (for example, listening and taking notes at the same time). It also affects the ability to set goals, self-monitor, initiate, plan, and shift ideas to find alternative solutions to a problem, or shift to a different subject, book, etc.

These executive functions develop at a greater rate in early adolescence (ages 12 and up), progressing through high school. The full impact of a student's brain injury, and ensuing problems with executive functioning, may not become evident until junior high or high school as the curriculum becomes less teacher driven and more conceptual.

Psychosocial issues

A student with a brain injury can have psychosocial difficulties for many reasons. The student may have unresolved fears and resentment about the injury. The part of the brain that influences emotional functioning may have been damaged. The student may feel insecure, isolated and different from peers. These issues may appear in the following ways:

Behaviors

Behavioral and personality changes often present the greatest challenges for the student after a brain injury. These changes are seen not only in moderate and severe injuries, but also in mild ones. If a student had any preexisting psychological or emotional problems, it is likely that a brain injury will exacerbate those problems. The same is true for those students with a previous psychiatric history. Special attention and support is crucial during recovery, treatment, and school reentry for these students. Psychosocial effects of brain injury can be the result of:

- brain damage
- emotional difficulties prior to the injury
- changes in intelligence
- cognitive changes leading to behavioral, social and emotional reactions
- emotional trauma
- loss of family or friends in the incident which caused the injury

Psychotherapeutic approaches for students with brain injuries differ from approaches used with other students. Effective approaches depend upon the student's age, severity of the brain injury, and pre-injury personality traits. The cognitive issues affecting the student in school can affect how counseling is provided. Students with brain injuries may require different therapeutic techniques because of these impairments.

When the brain injury causes changes in behaviors, a behavioral psychologist may create a behavioral management program to be consistently used by everyone involved with the student. Rather than attempting to reward or punish behavior after it has occurred, a more effective strategy is to identify the precipitating event or cause of the behavior. It is more productive to focus on managing the antecedents to the behavior when a student has a brain injury, instead of focusing on the consequences.

For example, the student who is constantly turning in incomplete or inaccurate homework may be working in an environment that is too distracting, thus reducing concentration. By setting up a quiet study environment, distractions lessen and concentration increases, thus resulting in complete and more accurate work with lower frustration.

Influence of age of injury on behavior

The age of the student when injured has a profound effect on behaviors. Preschool and primary aged students are likely to show characteristics of an attention deficit disorder with hyperactivity, distractibility, impulsivity, and a short attention span accompanied by acting out behaviors. By contrast, some students may experience lethargy, an effect that could be described as decreased emotions.

Middle and high school aged sudents are likely to have acting out behaviors such as agitation, hostility, and disinhibition. All these can lead to substance abuse, inappropriate sexual conduct, delinquency, and involvement with the law enforcement system.

Preschool years
Preschoolers with brain injuries often are not reported to educational systems. Consequently, many do not receive special education services. It is very difficult to determine whether a short attention span is the result of a brain injury or whether the child has Attention Deficit Hyperactivity Disorder, or neither of the two. Better programming can be developed when schools have updated medical information that includes falls or other accidents, as well as conditions such as seizure disorders and tumors. Unfortunately, many falls, accidents, and cases of abuse go unreported. It is critical that team members have as much information about the student's history as possible. When combined with the teachers' observations about the child's cognitive, communication, motor, social, and emotional functioning, a program suited to the individual needs of the child can be developed.

Predicting success for preschoolers with brain injuries is different from predicting success with adolescents, or even with older elementary school age children. Preschoolers have no history of cognitive functioning as a baseline. They often do not have any motor or speech problems and look fine. Academic problems may not appear until higher level cognitive skills, such as abstract thinking, are required during later years in school.Social skills may also be problematic and caused by injuries during these early years.

Elementary school years
A brain injury during these years generally requires interventions in school to help these students learn. Because of their age, higher order cognitive skills such as abstract reasoning have not been developed and difficulties may show up later. These students respond better than older students to using strategies, even though the learning process is disrupted. The reason seems fairly clear; these students do not need time to adjust to a new way of learning. Their learning pattern is not yet reinforced, so adapting to a different way becomes easier.

Later school years
Adolescents have the hardest time adjusting to a different self and a different way of learning. Their identities are so very important at this stage, but a brain injury leaves them not knowing who they are and what they can do. Often, adolescents become isolated from peers and family, neither of whom may fully understand the turmoil that the student has to deal with every day in school. Change in academic levels, modified schedules, and changes in future goals are all part of this emotional turmoil. These students can be helped through counseling and by explanations to peers. When peers understand how and why the student has changed,
they can learn how to adjust and how to help.

Influence of peers on behavior

Loss of friends and peers is common among students with brain injuries, although the timing varies. Friends tend to pay hospital visits at the beginning, but these visits become less frequent as time elapses. If members of the peer group were involved in the incident that led to the student's brain injury, feelings of guilt can affect ongoing contact with their friend and the family.

Peers and teachers sometimes interpret the student's return to school as a sign that recovery is complete. In many cases, the effects of a brain injury are life long and recovery is never complete. Peers often overlook changes in course load or other modifications and only see that their friend is back in school taking the same courses, and so assume there are no problems. Such feelings reflect a lack of understanding and are not meant to be hurtful; however, hurt feelings can surface quickly. It is helpful when peer groups come to understand what their friend has undergone, what changes have occurred and, most significantly, how they can best support the student.

Students with brain injuries often have difficulty following conversations, particularly in a busy room and/or when the conversation is moving at too fast a pace. The student's confusion may lead to inappropriate comments and responses. Peers may now view their friend as "different" and not understand why this is happening. Unfortunately, this often leads to increased isolation. A social skills group with a focus on conversational skills serves as both a support group and a place to practice conversational skills in a less intimidating environment.

The extent of behavioral changes following a brain injury varies and is affected by:

- type and amount of support available from the school, family, and friends
- student's interest in improving
- nature of peer interaction
- student's abilities to self-monitor
- social skills
- insight into the injury.

Impact on Families

Many families describe the experience of brain injury as a "living nightmare" during the early stages of hospitalization. Having seen their child in a coma and fearing that their child might not survive, the initial physical recovery of many children truly seems "miraculous" to many parents. However, as children return to school, parents become aware that the physical recovery can be deceptive. Changes in learning now become the main concern.

Relief over leaving the hospital now changes into uncertainty about the child's future. Most families have no prior experience with special education prior to a child's brain injury. They now enter a new world of terms, staff, meetings, regulations and procedures that are confusing at best, and frustrating at their worst. Educators can help by guiding families through this process and involving them whenever possible. Most of all, educators can help by listening to families. After all, they still know their child best - before and after the injury. They are valuable and critical participants of the educational team.

Chapter 3
School Re-Entry

Is this student ready to return to school? That is the question asked by educators and parents if the student has been out of school for medical and rehabilitation treatment. Results from assessments performed by rehabilitation and educational teams help determine what services the student will need upon discharge from the hospital.

Neuropsychological evaluation

A neuropsychological evaluation is administered by a neuropsychologist. This is a doctoral level psychologist with extensive training in brain-behavior relationships. The evaluation is usually performed during the child's inpatient or outpatient rehabilitation. Many areas of cognitive functioning are assessed including:

- perception and motor skills
- attention and concentration
- rate of information processing
- intellectual and academic functioning
- memory (short and long term)
- communication skills
- styles of learning new information
- organizational skills
- problem solving abilities
- executive functioning
- social skills and emotional functioning

The examination is lengthy because there are many areas to assess. It differs from standard psychological evaluations, not so much in content, but rather in the degree to which each area is assessed. This group of tests is essential for defining the cognitive strengths and weaknesses of the student. It is crucial for planning cognitive and educational programming. At present, educational systems typically outsource this evaluation due to the specialized expertise and time required.

The results from an initial neuropsychological evaluation are important for determining the student's academic program soon after the injury. They cannot predict or determine the student's academic and social performance in future years when developmental maturation may bring new cognitive challenges. It is important for students to be reassessed as they recover from their brain injuries, and also as they move from one developmental stage to another.

It is not unusual for initial intelligence scores to be depressed. They are generally useful as baseline data. Improvement in intellectual functioning often occurs during recovery from the brain injury and with cognitive rehabilitation.

Educational evaluation

Educational evaluations are often not administered until a student returns to school, unless they were completed in a rehabilitation setting by independent examiners. There are no specific educational tests for students with brain injuries. For this reason, results should be used with caution.

Educational evaluations and academic level testing are reflective of what a student has learned, but may not reflect the student's ability to learn *new* information. Results may not reflect the student's actual performance in the classroom where there is greater stimulation, distraction, need for recall, and new learning with demands for increased processing speed. All these cognitive areas are critical to learning, yet educational evaluations frequently do not provide this information. The educational evaluations do provide a baseline level of academic skills for initial interventions.

Before planning a program, the educational specialist needs to incorporate the results of the neuropsychological evaluations with any other discipline specific testing. It is important, not only to define initial academic skill levels, but also to determine how the learning process is affected by the student's cognitive functioning. Assessment of cognitive strengths and limitations and determination of needed compensatory strategies is as valuable as determining the specific grade/ age level of academic skills.

Cognitive rehabilitation

Cognitive rehabilitation is often recommended to improve a student's performance in the classroom. The field of cognitive rehabilitation encompasses many different professionals who share expertise in working with neurological issues. Cognitive rehabilitation focuses on retraining the thinking processes that are affected by a brain injury. These are the very thinking skills that are required for a student to function and succeed in school. It is likely that learning abilities will be different and less efficient than prior to the injury. For some students with brain injuries, skills are permanently damaged and require a compensatory, rather than remedial, approach.

Cognitive rehabilitation may be provided in an individual or group format that simulates a classroom environment. Strategies are designed to help develop the following skills:

- focusing on a task
- generating ideas
- problem solving and decision making
- forming opinions
- categorizing and understanding concepts
- making and testing predictions
- recognizing how new information relates to old information
- arranging information in sequential order
- strengthening recall of information
- processing and interpreting information

During cognitive rehabilitation, it is beneficial for the student to receive academic instruction as well. Depending on the needs of the student and the setting, academic instruction can be provided either at the cognitive rehabilitation facility, in the student's home, or in the regular school setting.

Home instruction

Home instruction typically begins during the hospital stay, once medical issues have been stabilized and the student has a sufficient energy level for academic work. By monitoring the student's tolerance, time allowed for instruction (typically five hours per week for non-classified students) can be best utilized. This is a good time to begin the process of evaluation to determine eligibility for special educational services. Even if the student is not ready for formal school re-entry, once found eligible for special education, the student can then receive the maximum ten hours per week of home instruction.

A student with a brain injury often returns to school part-time with a gradual increase in hours until a full-time schedule can be maintained with appropriate services. Given this part-time schedule, a home instructor may be part of the academic team. It is important for the home instructor to understand the needs of the student, the impact of the brain injury, strengths and weaknesses, and compensatory strategies. With proper preparation, the home instructor becomes the person who communicates with other school personnel about effective strategies, processing issues, and learning needs for this student.

Special services or accommodations in school

One of the most important decisions that families and healthcare and education professionals face is whether the student is ready to return to school. Factors to consider for this return include changes in:

- medical stability
- energy level
- attention and concentration
- memory
- organizational abilities
- ability to handle stimulation of a small group or classroom

In actual practice, the timing for a child's return to school is affected by considerations other than these readiness factors. The current healthcare environment includes shorter stays in acute care hospitals and rehabilitation programs. There is often limited access through health or car insurance funding for necessary therapies. For both reasons, children may well return to school needing to continue their rehabilitation. Based on the student's functional abilities and limitations, it is a good idea to explore eligibility for special education and related services or other accommodations *prior* to a student's return to school.

Creativity at school can make the difference between a child's success or failure in school.

The ongoing changes in the student's brain require flexible programs. The confines of the general education system may unduly limit the scope of services that are available. Differing degrees of supports and academic assistance may be available through either the federal Individuals with Disabilities Education Act (IDEA) and/or Section 504 of the federal Rehabilitation Act of 1973.

Section 504 Plan

The language of Section 504 is similar to the Americans with Disabilities Act; it bars discrimination against children and adults with disabilities by all recipients of federal funds (including public schools and private schools).

> **Disability is defined by Section 504 as a mental or physical impairment which substantially limits one or more "major life activities" including walking, seeing, hearing, speaking, breathing, learning, working and caring for oneself.**

Section 504 provides for "reasonable accommodations" which are typically provided within general educational programs. The written document detailing needed accommodations is referred to as a Section 504 plan.

IDEA

IDEA refers to the federal Individuals with Disabilities Education Act, reauthorized in 2004. This law provides for a free and appropriate education for all students from birth through age 21 in the least restrictive environment.

Traumatic brain injury (TBI) has been listed as a separate handicapping condition under federal law since 1990. The Individuals with Disabilities Education Act (IDEA) outlines the conditions that fall within this classification, formally defining TBI as "an acquired injury to the brain caused by an external physical force, resulting in total or partial functional disability or psychosocial impairment, or both, that adversely affects a child's educational performance."

The definition continues to specify, "Traumatic brain injury applies to open or closed head injuries resulting in impairments in one or more areas, such as cognition; language; memory; attention; reasoning; abstract thinking; judgment; problem-solving; sensory, perceptual, and motor abilities; psycho-social behavior; physical functions; information processing; and speech. The term does not apply to brain injuries that are congenital or degenerative, or to brain injuries induced by birth trauma."

If a student with a brain injury can handle a grade-level curriculum only with accommodations in the classroom, the development of a Section 504 plan may be appropriate, with the necessary accommodations listed. If grade-level curriculum cannot be handled even with accommodations, the student should be evaluated for eligibility under IDEA.

> **ALERT!** Because of how the brain develops, difficulties may appear as the student becomes older and more abstract thinking and organization are required. Ongoing monitoring is strongly recommended to identify any "late effects" even if the student initially appears to have no major weaknesses after the brain injury.

Some differences between Section 504 and IDEA

Common Questions	IDEA	Section 504
Purpose	To provide a free, appropriate public education (FAPE) in the least restrictive environment	To provide people with disabilities, to the maximum extent possible, the opportunity to be fully integrated into mainstream American life.
Scope	Applies to all public schools (and charter schools)	Applies to any program or activity that receives federal financial assistance
Protection	Children and youth from birth through high school graduation who fall within one or more of the specific categories of qualifying conditions – Traumatic Brain Injury (TBI) is included as a category	Any person, child or adult, who (1) has a physical or mental impairment that substantially limits one or more major life activities, (2) has a record of such an impairment, or (3) is regarded as having such an impairment – Individuals with brain injury are protected in and out of school
Legal	Procedures for ensuring enforcement are specified under the federal Individuals with Disabilities Education Improvement Act regulations	Procedures for ensuring enforcement are specified under federal 504 and Americans with Disabilities Act regulations.
Eligibility	Requires that a child's disability affects his/her educational performance - All students who are eligible under IDEA are also eligible for Section 504	Not all students who are eligible for Section 504 are also eligible for IDEA
Evaluation	Requires that a child be comprehensively evaluated by a multidisciplinary team	Evaluation draws on information from a variety of sources and is documented
Resulting Document	Requires an Individualized Education Program (IEP)	Does not require an IEP, but does require a written plan
Annual Review	IEP must be reviewed once a year at minimum	504 plan must be reviewed periodically, but it is up to the educational agency or institution to establish procedures for review
Reevaluation	Required every three years or more frequently if needed, or at request of the parent, but not more than once a year, unless the district and parent agree	Required before significant change in placement for school-aged children – Post-secondary education requirements vary from school to school

Accommodations in a Section 504 Plan

Many types of accommodations can be provided depending on the needs of the student. Accommodations commonly provided in a Section 504 Plan are listed below:

Test-taking accommodations include...

- •extra time for tests
- • dictating responses
- • taking tests in a quiet setting
- • having directions read, repeated or re-worded

Classroom environment accommodations include...

- • preferential seating
- •use of an FM system (headphones that directly link the teacher to the child and screen out extraneous noise)
- • note-taker

Equipment access accommodations include...

- • calculator
- • laptop computer
- • tape recorder

Assignment accommodations include...

- • shortened class work
- • shortened homework tasks
- • enlarged print

Accommodations may also be made for behavior management and other areas, again depending on the needs of the student.

Appropriate classification for students with brain injuries

If classification is indicated, students with traumatic brain injuries should be classified under the category of “traumatic brain injury” whenever possible. Even when there are multiple disabling conditions secondary to the brain injury, it is important that TBI be listed as one of the disabling conditions. Despite having a distinct TBI classification, some districts erroneously classify the student with a brain injury under “specific learning disability” or “emotional disturbance”.

Alternate classifications are ill advised as students with brain injuries often have learning needs that are unique and require special programming. Further, classifying such students on the basis of their brain injuries helps ensure that statistics on the incidence of TBI are accurate. This leads to more appropriate funding, research, and the ability to determine the effectiveness of school programs. If erroneously classified under another category, the magnitude of this population and its needs are underestimated.

Unlike other educationally disabling conditions that are developmental and of lifelong duration, the status and needs of students with brain injuries often change, requiring specialized and flexible programming. The pattern of recovery is a process that may be extended and unpredictable.

Students with brain injuries may remember how they functioned and learned prior to their injuries. This can lead to depression, anger and frustration over their changed abilities. Their previous learning styles and work habits may no longer be effective and can interfere with the student's willingness and abilities to learn new
strategies. Furthermore, these students are often characterized by greater inconsistencies in their learning profiles in comparison to students with other educationally handicapping conditions.

Indeed, it is good practice for school districts to include questions regarding any history of brain injury, loss of consciousness, or falls when:

- conducting routine preschool and kindergarten screening
- screening referrals to Child Study Teams, and
- updating student health records

By asking these questions, the etiology for learning problems may be better understood. Gathering this information helps differentiate between the needs of students with learning disabilities and those with brain injuries.

Similarities and differences among students

Students with brain injuries share common characteristics with students having other handicapping conditions. Students with brain injuries may *appear* similar to students with learning disabilities in school since they are experiencing learning problems. However, it is their *differences* that set them apart.

What is the difference between brain injuries and specific learning disabilities?

A student with a brain injury may have a prior knowledge base that is still intact following a brain injury, however their ability to learn new information may be impacted. Unlike a child with a specific learning disability, they need to adjust to a new way to learn.

For teachers to work with students with brain injuries, it is critical that the differences between them and students with specific learning disabilities be clarified. The following highlights some of these similarities and differences:

Similarities

Students with brain injuries and students with specific learning disabilities may both exhibit…

- reduced attention span, distractibility, impulsivity
- low frustration tolerance
- weak organizational skills
- overwhelmed reaction to too much information
- inappropriate social judgment
- problem with integration skills
- slow processing of information
- deficits in problem solving and abstract thinking
- reduced performance relative to abilities

Differences
Compared to students with specific learning disabilities, students with brain injuries may have...

- greater variation in performance levels
- wider gap in abilities
- adjustment to learning with a different style than prior to injury
- more difficulty with new learning; old facts more often retained
- more pronounced memory deficits
- adjustment to a new and different self from pre-morbid self
- greater success learning prior to brain injury
- altered social contacts, loss of friends
- exaggerated inconsistent performance
- reduced self-control
- wide range of inappropriate behaviors
- lack of insight into problem

How do students with brain injuries differ from those with cognitive impairments?

A person with a brain injury may demonstrate problems that suggest reduced cognitive functioning. For some, scores on formal intelligence tests fall within the mentally handicapped range. The classification of students with brain injury should not be based soley upon an IQ score, which may be depressed.

The IQ score is not representative of the student's actual learning potential after a brain injury.

Similarities
Students with brain injuries and students with cognitive impairments may both exhibit…

- problem solving difficulties
- weak abstract reasoning
- reduced judgment
- overwhelmed reaction to too much information

Differences
Compared to students with cognitive impairments, students with brain injuries have...

- inconsistent learning rate
- no previous history of special education
- need to adjust to changed sense of "self" by student, family, and peers
- more inconsistent behavior

How do students with brain injuries differ from students with emotional disturbances?

Students with brain injuries may have attention, impulse control, and cognitive difficulties that affect their behavior and emotional stability, but the cause is primarily organic. This may or may not be the case with students classified as emotionally disturbed. While some of their behaviors may appear similar, responses to interventions often differ. For example, injury to the frontal lobe may result in poor ability to respond to reward and punishment systems.

Similarities

Students with brain injuries and students with emotional disturbances may both exhibit…

- reduced self-control
- difficulties regulating mood

Differences

Compared to students with emotional disturbances, students with brain injuries have...

- over-sensitivity to change
- over-sensitivity to sensory stimuli such as noise, movement, temperature, light
- limited or lack of awareness of deficits
- poor recognition of cause and effect relationships
- more impulsivity, confusion and/or disinhibition
- less responsiveness to rewards and punishments

Least Restrictive Environment

There is no one specific placement that is appropriate for all students with brain injuries. The goal is for the student to participate in the least restrictive environment (LRE) that will enhance abilities and address difficulties or disabilities. Initially it may be beneficial to provide more intense support to minimize academic or social problems, or physical fatigue.

There are different philosophies on this issue. Some feel that every effort should be made to have the student enter the same program as prior to the injury and then add services as needs become evident. Others feel that providing a more intense level of service initially gives a greater “safety net” that can be reduced later as the student improves.

You may copy the following page to use with a student by checking characteristics that apply. By doing this at regular intervals, you can track the student’s progress and identify new difficulties. This information can be very useful for IEP meetings, problem solving and developing educational strategies.

The checklist on the next page includes factors to consider for determining appropriate support and accommodations for the student with a brain injury (check items that apply).

Student name _____ •**Date** _____

Health-related issues
- ☐ medical equipment
- ☐ safety precautions
- ☐ seizure control
- ☐ spasticity
- ☐ headaches
- ☐ pain
- ☐ medical procedures during school day
- ☐ medication and possible side effects
- ☐ stamina for a full day
- ☐ rest periods

Self-help skills
- ☐ eating
- ☐ toileting
- ☐ clothing

Mobility
- ☐ barrier-free environment
- ☐ assistance with transfers
- ☐ equipment

Rehabilitation therapies
- ☐ speech therapy
- ☐ occupational therapy
- ☐ physical therapy
- ☐ psychological counseling
- ☐ assistive technology

Communication accommodations needed
- ☐ augmentative system
- ☐ note-taker
- ☐ sign language interpreter

Behavior
- ☐ behavior intervention plan
- ☐ person to oversee/monitor behavior plan
- ☐ classroom or individual aide
- ☐ structure needed
- ☐ positive behavioral supports

Supervision
- ☐ plan for unstructured times, i.e., school, recess, and lunch
- ☐ structure/cueing needs within classroom

Determining the level of supports and services a student with a brain injury needs should be determined on a subject by subject basis, and taking into consideration the student's strengths and weaknesses. New Jersey special education rules and regulations provide for a variety of program options in the general education class, including curriculum modifications; specialized instructional strategies; assistive technology devices; teacher aides; related services; integrated therapies; in-class resource programs; and consultation services. In addition, a full continuum of alternative placements (e.g. resource programs, special class programs) are available.

The following are some creative examples of how to combine services:

- Placing a student with an aid and communication device in a general educational classroom
- Having a student who is placed out of district transition back into district on a part-time basis. For example, having the student attend morning classes with supports and accomodations within the district school, and out of distrct classes in the afternoon

Another consideration is extended school year services. Without continued academic instruction and cognitive therapy during the summer, students with brain injuries often lose some of their academic gains, particularly during their first year back in school.

Child Study Teams need to be flexible in reviewing program needs for students with brain injuries as ongoing progress will occur, especially within the first 18 months to 2 years post injury. The IEP is generally developed for a one-year period. At the request of a parent or any other member of the child study team, more frequent reviews of the student's IEP may be necessary during the first year after a brain injury, when rapid change takes place.

Preparing for the student's return to school

Good communication and careful coordination among the hospital or rehabilitation facility, the family, and the school system are keys to a student's successful return to school. A medical approval may be required for reentry if the student was not in a rehabilitation program. However, this approval does not always indicate cognitive readiness. These students need close monitoring upon their return to school.

If the student has been in a rehabilitation setting, members of the rehabilitation team can participate in planning the transition along with the school principal, school nurse, Child Study Team, guidance counselor, teachers, school-based therapists, parents *and* the student. Sometimes a rehabilitation nurse, assigned by the insurance company, is also involved. Designating a case manager from the school helps insure that clear and ongoing communication occurs. This also helps the family, which likely has been the liaison between medical and school settings.

It is beneficial for the school case manager to attend hospital or rehabilitation patient conferences to become acquainted with the student's needs. Even after the transition to school occurs, frequent meetings are important to continually review, evaluate and change goals as the student's needs change. The school nurse may prepare an Individual Health Plan (IHP), describing medical needs for the student.

It is essential that the student, family, school staff and peers be prepared for the student's return.

Preparing school staff

It is important to prepare school staff who will be working with the student prior to reentry. General information about brain injury, and specific information about the returning student, help staff understand the student's unique needs. It is particularly important for school staff to understand that deficits or changes are not the result of laziness, lack of discipline or malingering. Hospital or rehabilitation center staff typically welcome the opportunity to visit the school and provide information about brain injury.

Suggestions for preparing school staff include...

- •describe any changes in the child's appearance or physical abilities.
- •prepare behavioral and communication strategies, including how information or directions are presented to the student.
- • review how to use any assistive equipment.
- • arrange opportunities for staff to ask questions and present their concerns.

Preparing peers

Peers often interpret a student's return to school after a brain injury as a sign of full recovery. They may reject the student who is not fully recovered unless they are helped to understand changes.

Suggestions for preparing peers include...

- •consult with the student and family to determine what information they want shared with peers.
- •consider needs for privacy but explain that peer acceptance may be facilitated if peers are helped to understand how the brain injury has affected the student.
- • describe any changes in appearance.
- • create a "circle of friends" to help promote social transitions.

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. Students of all ages and abilities can be quite flexible if an atmosphere is created that allows for peer interaction as a normal psychosocial process.

Providing information to peers helps answer typical questions, such as:

"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?"

The decision about how much to share and what format to use is a personal one. If the student with brain injury is the person providing the information, make sure that the student is comfortable in the role of being the speaker. Having the student meet with small groups may be preferable to presenting the information to a large audience.

Real-Life Story

Two high school students had brain injuries in the same motor vehicle incident and attended the same high school. After they were nearing the end of their cognitive rehabilitation program and getting ready to attend school full-time, they worked on the development and execution of a presentation about their brain injuries. Their combined goal was to educate their peers, teachers, and other school staff as well as their families about the impact of brain injury on their lives. They discussed how they had to adjust to changes in their learning styles, loss of friends, loss of jobs, and family disruptions. Following each of their 15-20 minute speeches, they took questions from the audience that included most of the student body from the entire high school. Afterwards their peers came up and expressed their sadness that they had not understood what they were going through. The comments were unanimous that their peer group wished they had been more aware of the effects of the brain injury. This story occurs many times in different schools The students and schools change; the importance of peer education remains the same.

Preparing the family

Since many students with brain injuries have no prior experience with special accommodations or special education, their families need information about the special education or Section 504 process, special services, and development of an PPT or Section 504 Plan. Having recently learned medical terminology, they must also learn new terminology for special education. Given the stress they have already faced, these families require special sensitivity and empathy from school staff.

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

Siblings are too often overlooked. They may have witnessed the events of the injury and have feelings associated with that experience. Likely, they too have been stressed along with their parents by the injury and recovery process. Siblings may even exhibit jealousy and resentment over all the attention given to the child
with a brain injury and feel neglected by comparison.

Suggestions for helping siblings include...

- carefully monitor siblings' work, appearance and behavior.
- be sensitive to the need for any accommodations due to preoccupation, reduced concentration, and changed mood or behavior.
- consider counseling if concerns continue.

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 can understand that they are having difficulty remembering things since they hurt their heads. It also helps them to know that learning some subjects may be more difficult than it used to be. This may help them better accept necessary modifications. Understanding the effects of the injury establishes a foundation for learning self-advocacy skills. Discussions and even role-playing help prepare the student for handling anticipated interactions with peers and staff.

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

Chapter 4
Cognitive Changes in the Classroom

Cognitive deficits are very common after a brain injury and have profound effects on everyday life. The following chapter provides lists to show how various cognitive deficits present in the classroom, and sample strategies you can use. It is important to remember that all brain injuries are unique and that all students have different strengths and weaknesses, therefore different strategies may or may not work depending on the student, the class, and the time of day, among other factors. It is important to remain flexible in trying different strategies until you find one that works for that student.

In addition to cognitive deficits that directly affect academic performance, brain injuries can also alter behavioral and emotional functioning in the classroom. The most frequent behaviors that affect academic functioning are irritability, hostility, aggression, disinhibition (decreased emotional control such as sudden crying), poor insight into problems, apathy, depression, poor judgment, and mood swings. Neurophysiological damage can also interfere with sleep, which further affects the ability to function in the classroom. Notice, as you read through the strategies, if these issues have also been considered.

You can copy the following pages to use with a student and check items that apply.

Attention/Concentration deficits

This student has difficulty with…

- ❑ talking out of turn
- ❑ tuning out distractions, such as nearby conversations
- ❑ following directions
- ❑ completing a classroom assignment
- ❑ switching from one activity to another
- ❑ being able to filter out and ignore background noise (ignoring a student talking behind them while the teacher is speaking)

Strategies to help that student may include…

- ❑ modifying information and breaking down tasks
- ❑ subtle cueing
- ❑ reducing visual and auditory distractions in the classroom
- ❑ preferential seating away from distractions
- ❑ using enlarged work
- ❑ stressing important information
- ❑ helping the student focus through routine
- ❑ shortened work
- ❑ providing advanced warning that you will be shifting to another topic, activity, class, etc.
- ❑ displaying and referring visual transition cues (“to do list” or schedule posted on the board or desk)
- ❑ positive reinforcement for on task behavior and turn taking
- ❑ testing accommodations, such as extended time, modified tests and quizzes, testing in a separate room

Neurofatigue

This student has difficulty with…

- ❑ fatigue after mental effort

Strategies to help that student may include…

- ❑ scheduling rest breaks during free period or at appropriate times during the day
- ❑ arranging the class schedule, if possible, for more mentally challenging classes to be spread out during the day or earlier in the day
- ❑ discussing with parents practicing a consistent bed time to ensure enough sleep prior to going to school

Communication deficits

This student has difficulty with...

- ❑ taking tests that ask for specific names
- ❑ following a conversation when others are talking
- ❑ comprehending class discussion and/or what has been read
- ❑ organizing thoughts resulting in a choppy presentation with important details omitted
- ❑ word finding
- ❑ reading nonverbal cues
- ❑ pragmatics – turn taking, reading body language, give and take during conversations

Strategies to help that student may include…

- ❑ provide alternative testing: matching, multiple choice, etc. that depend on recognition and not retrieval
- ❑ provide word banks
- ❑ providing an outline in advance of lectures
- ❑ use visuals (projected class notes or presentation) to reinforce/support lecture
- ❑ desk copy of projected (overhead, powerpoint, proxima, etc.) notes
- ❑ assisting with an outline for presentations
- ❑ limit the amount of information and use concrete language
- ❑ asking the student to repeat or paraphrase what was said in order to clarify that they understood what was said
- ❑ utilize social skill groups or a circle of friends with non-disabled peers to teach social skills

Information Processing

- **Rate of processing**

This student has difficulty with...

- ❑ keeping up with the flow of information discussed
- ❑ processing simultaneous information
- ❑ shifting topics; still on a previous topic without realizing shift to new area
- ❑ keeping up with more detailed information
- ❑ processing; the more complex the information, the longer it takes

Strategies to help that student may include…

- ❑ scaffold learning - provide the opportunity to preview at home or school
- ❑ call up prior knowledge – link new learning to existing knowledge
- ❑ allow extra time to process information, as well as retrieve and generate information
- ❑ teacher prepared notes, pre-reading and study guides in advance of a lecture or
- ❑ discussion

- ❑ use visual supports to support instruction (note frames, overheads, proxima, powerpoint, etc.)
- ❑ summarizing at the end of a topic
- ❑ direct teaching of study skills, including taking notes from a text or reviewing vocabulary for a unit
- ❑ chunk information together
- ❑ extended time on tests and in-class assignments
- ❑ reduced homework assignments that reinforce concepts previously instructed in class

Simultaneous processing

This student has difficulty with...

- ❑ listening to a lecture and taking notes at the same time
- ❑ reading from a text and determining what is important to remember

Strategies to help that student may include…

- ❑ notetaker or teacher prepared notes
- ❑ reviewing the chapter summary or study guide before reading the chapter
- ❑ summarize at the end of each main idea and student writes down information
- ❑ advanced organizers

• **Sensory Processing (Visual, Auditory, Kinesthetic, Tactile)**

This student has difficulty with…

- ❑ visual – difficulty with tracking, scanning, visual field cut, being able to integrate information that is presented visually
- ❑ auditory – does not process well if information is not presented slowly and clearly, distractions also interfere with attending
- ❑ kinesthetic – not being aware of your own surroundings, over or under reaching for things, clumsiness, bumping into things
- ❑ tactile – sensory seeking or hypersensitive to sensory stimulation, i.e., needing a lot or having an aversion to touching

Strategies to help that student may include…

- ❑ visual – reducing the amount of visual distractions (tracking with a finger or index card); avoiding bubble response tests; highlighting
- ❑ auditory – seat student away from distractions; allow testing in a quiet place; provide visual information to supplement class teaching/discussion; student can listen to taped lectures at own pace, with text at the same time as an option; teacher sensitivity to student's confusion; clarify by repeating, rephrasing, requesting questions, etc.; audio system that focuses on just the teacher's voice
- ❑ kinesthetic – using 3D manipulatives (concrete, real life objects), i.e., using real money; role playing and social skills for clumsiness, bumping into others, learning personal space; for movement, teaching right and left and backwards and forwards by having the student move right and left, etc.
- ❑ tactile – raised line paper; re-teaching letters; occupational therapy as a possible referral
- ❑ teach through another stronger modality
- ❑ teach multi-modally and multi-media (lecture with hands-on, lecture with group work)
- ❑ add visual presentation to accompany auditory presentation and vice versa

Memory

This student has difficulty with..

- ❑ **instructions** *Example* - homework is often incomplete if instructions are not written down in step by step detail
- ❑ **recent events** *Example* - the student forgets she was just in math class and goes to it again or repeats the same story over and over again
- ❑ **names** *Example* - the student forgets the names of teachers even though they look familiar
- ❑ **scheduling** *Example* - the student forgets what classes are at what time, despite having been in school for several days or weeks
- ❑ **orientation** *Example* - the student forgets what day or month it is
- ❑ **short term recall** *Example* - the student can't remember what was done yesterday, this morning, or even a few hours ago
- ❑ **prospective memory or planning ahead** *Example* - the student shows up for the class field trip and is told that he can't go because he has forgotten to get a permission slip, take it home, have it signed by a parent and returned to school.
- ❑ **new learning** *Example* - the student can remember how to do addition and subtraction but multiplication taught after the injury is difficult to comprehend and/or memorize

Strategies to help that student may include…

- ❑ homework book and notes (teacher writing down homework, making assignments available online, homework hotline)
- ❑ daily schedule
- ❑ calendar, electronic organizer
- ❑ predictable classroom routines and procedures
- ❑ lists and checklists
- ❑ watches and timers
- ❑ audio recorder
- ❑ rhyming and mnemonic techniques
- ❑ provide information more slowly
- ❑ repetition, frequent review and multi-sensory presentation (auditory and visual)
- ❑ develop/monitor student notebook with organizers, math step cards, schedules, calendars, etc.
- ❑ consistency and organization
- ❑ relating new information to learned information
- ❑ clustering information
- ❑ repeat directions, provide cueing to help with memory (begins with the letter "s"), write down directions
- ❑ diary, journal, memory or log book for what the student does at home (to aid in social skill development) and school
- ❑ memory books with pictures of teachers, their name and the subject they teach
- ❑ map of the school, class schedule, and locker combination permanently in student's backpack

Executive Functioning

• **Organizational deficits**

This student has difficulty with...

- ❑ getting all the materials needed for class; always forgets some
- ❑ telling a story
- ❑ organizing notes
- ❑ deciding which of many steps goes first, second, etc.

Strategies to help that student may include…

- ❑ notebook or graphic organizer with schedule, calendar, folders, paper, index divisions, homework page
- ❑ customized organizational system for all materials
- ❑ different colored folders for different subjects
- ❑ notetaker or teacher prepared notes, including board assignments
- ❑ graphic organizers for written expression, note-taking, math work
- ❑ step cards for retellings, math calculation, etc.
- ❑ creating flow charts for tasks (task analysis – what to do 1st, what to do 2nd, what to do if something doesn't work, etc.)

• **Cognitive rigidity**

This student has difficulty with...

- ❑ shifting to a new topic after the topic was finished
- ❑ "getting stuck in one mode of thought or thinking" or perseveration

Strategies to help that student may include…

- ❑ summarizing at the end of a topic and concretely stating when you are moving to a new topic
- ❑ provide warning time for transitions, especially for changes in routine to allow the student to prepare for and expect the transition
- ❑ generating alternative solutions to different problems and practicing them

• **Reasoning/abstract thinking**

This student has difficulty with...

- ❑ using deduction to come to a conclusion
- ❑ essay questions compared to objective questions
- ❑ "why" and "how" questions compared to "where" or "when" questions
- ❑ understanding figurative language (idioms)
- ❑ generalizing concepts compared to recalling concrete details

Strategies to help that student may include…

- ❑ have the student paraphrase what they have read or what has been discussed
- ❑ with "why" and "how" questions use examples or rephrase the questions
- ❑ explain abstract language and concepts, and verify understanding
- ❑ a brief break before tasks and warning times when tasks will change
- ❑ use the SQ4R Method (Survey, Question, Read, Write, Recite, Review)

• **Problem solving**

This student has difficulty with...

- ❑ finding solutions to problems such as a lost pencil
- ❑ coming up with alternative solutions to a problem if the original one does not work
- ❑ using effective strategies to compensate for areas of weakness

Strategies to help that student may include…

- ❑ brainstorm alternatives
- ❑ model and role play problem solving
- ❑ use a problem solving model (define the problem, generate solutions, look at pros and cons for each solution, check results to see which solution is more viable)
- ❑ help to develop meta-cognitive skills (self-talk and self-analysis)
- ❑ positive feedback followed by constructive feedback and solutions for fixing the problem
- ❑ provide a checklist of steps for solving problems
- ❑ use of errorless learning (design tasks to ensure success and then the level of challenge can be increased gradually) to avoid frustration and a feeling of failure

• **Planning**

This student has difficulty with

- ❑ setting goals to work on
- ❑ planning and budgeting time for long term projects
- ❑ begins tasks too late to complete them

Strategies to help that student may include…

- ❑ self-monitor the amount of time it is taking to complete reading, tests, homework
- ❑ benchmark calendar for projects (what will be done by the end of week 1, week 2, etc.)
- ❑ to do list on the board or on a card on their desk or attached as a laminate to the zipper on their backpack
- ❑ cueing, beeper watch, cue cards
- ❑ set up chart with goals; use a timer to help pacing; reinforce task completion

• **Initiation**

This student has difficulty with…

- ❑ student has difficulty beginning assigned tasks
- ❑ taking the initiative to make changes

Strategies to help that student may include…

- ❑ model desired outcome
- ❑ divide task into steps
- ❑ provide time benchmarks
- ❑ model appropriate problem solving
- ❑ rewards for starting tasks
- ❑ to do list as an initiator
- ❑ environmental cues – for example, a timer or alarm to get started

• **Self-monitoring**

This student has difficulty with…

- ❑ self-monitoring and reviewing work for errors
- ❑ body regulation (tapping, getting up, not being able to sit still)
- ❑ regulating communication output (voice volume, taking turns)
- ❑ regulating behavior and unawareness of behavior issues
- ❑ hygiene awareness

Strategies to help that student may include…

- ❑ self-monitoring checklists
- ❑ proofreading (1st for fluency, 2nd for punctuation, 3rd backwards for spelling)
- ❑ use assisted technology to edit (Spell Check, Grammar Check, text to speech to listen to proof work)
- ❑ clearly state, teach, and reinforce behavioral expectations
- ❑ provide advanced preparation/rehearsal
- ❑ use of timers
- ❑ teach the student to ask for feedback from the teacher
- ❑ student contracts
- ❑ making the student aware of their issues with self-monitoring, including subtle cueing (such as a tap on the shoulder)

• **Control**

This student has difficulty with…

- ❑ using sound judgment and insight
- ❑ disinhibition (calling out answers, not waiting their turn)
- ❑ emotional regulation (laughing or crying inappropriately, overreacting)

Strategies to help that student may include…

- ❑ role playing, social stories
- ❑ clarify expectations and verbalize understanding of expectations
- ❑ external controls, implement a reinforcement system or response/cost system of behavior management
- ❑ breaks, shortened day to avoid behavior caused by cognitive fatigue
- ❑ functional behavioral assessment performed by someone familiar with brain injury to determine triggers and precursors

Chapter 5
Accommodations and Strategies

Instructional modifications and strategies may vary depending upon the severity of the cognitive deficits, age, and pre-injury functioning of the student. Many of these strategies are used with students with learning disabilities; however, many students with brain injuries may have never had to rely on any strategies before their injury. Accepting the need for strategies can be more difficult and may even be complicated by a memory deficit that affects recall of strategies. In addition, students with brain injuries may lack awareness of their deficits and thus fail to recognize the need for strategies. When strategies are needed, students should be taught the specific strategy and cued or guided until it becomes automatic.

An IEP for a student with a brain injury should be developed considering which cognitive skills have been weakened. When developing the IEP, it is important to highlight the specific cognitive deficits as the vehicle to meet content-oriented goals. Mastery of the academic material is dependent on reinforcement of cognitive ability through effective strategies. The IEP should emphasize the following:

Priorities for the IEP of a student with a brain injury

- ❑ Develop cognitive processes, thinking skills, and compensatory strategies that help the student learn more effectively and independently.
- ❑ Improve executive control and self-monitoring over cognitive and behavioral functioning for social, and ultimately, vocational success.
- ❑ Learn academic content as a vehicle for developing improved processing and behavioral self-control.

This chapter identifies some areas to consider, along with possible strategies.

Learning Strategies

Learning strategies are the particular approach or method that a student uses to work on a task. By knowing which strategies work best in given situations, students can learn to analyze a task, decide which strategies to use, perform the task using those strategies, and evaluate the effectiveness of selected strategies.

Students with brain injuries usually require many strategies. Teachers can provide some of these strategies, while others need to be identified by the student. Learning strategies help students process, acquire, store and express information.

Testing Strategies

The following testing strategies can be considered, depending on the student's strengths and weaknesses.

- ❑ Enlarged materials

- ❑ Screening out extra stimuli, such as using a separate sheet of blank paper to block out parts of the test the student has yet to work on
- ❑ Unlimited time, extended time or break times
- ❑ Providing a word bank for fill in the blank questions
- ❑ Utilizing illustrations to enhance understanding
- ❑ Permitting alternative means of output, such as oral, written, or nonverbal
- ❑ Modifying directions accordingly: reword, simplify, give examples
- ❑ If possible, avoid more than one test on the same day
- ❑ Announce tests with adequate prep time (4 days minimum)
- ❑ Avoid scantrons and bubble response tests
- ❑ Consider the use of assistive technology, based on the student's needs
- ❑ Allow the student to type answers, especially if handwriting is difficult due to physical reasons

Real-life story

Jack, a sixteen year old student with a brain injury, looked forward to his history class and learning about the past. He always listened attentively in class, and read the required readings in advance of class lectures. Although his teacher knew he was interested in history and paid attention in class he did poorly on the essay quizzes students were required to complete at the end of each section. Jack was provided with multiple choice quizzes that made it easier for him to recall information and his quiz grades subsequently improved.

Steps for Teaching Strategies

❑ Step 1	Motivate	Emphasize the usefulness of the strategy and its application to specific tasks such as note taking and assignment completion.
❑ Step 2	Describe the strategy	Give step by step directions.
❑ Step 3	Model the strategy	Preview with the student.
❑ Step 4	Verbal rehearsal	Teacher and student use strategy together.
❑ Step 5	Guided practice	Student practices using strategy; teacher gives feedback; no task demand.
❑ Step 6	Fade	Student tells self how to use strategy while fading out obvious cues.
❑ Step 7	Independent practice	Performed while using content materials.
❑ Step 8	Generalization	Performed while using varied materials.
❑ Step 9	Feedback	Teacher and student talk about the effectiveness of the strategy.

Real-life story

Karen initially had difficulty letting go of an upsetting event that happened during the school day. Even a small event could upset Karen and interfere with her studies. The first step taken by staff was to allow Karen to go to the school office and speak with someone (several staff were designated) about her problem of the day. After Karen was calm again, the staff person helped Karen develop a script to determine whether something was a "big deal" or a "little deal". As time passed, Karen was still allowed to leave class to go to the office, but the visits became shorter as Karen and staff practiced the script. Before long, Karen would visit the office, sit in a chair and think the problem over by herself without staff help, and then return to class on her own. Soon she was able to just step out into the hall for a few minutes to calm herself down and eventually she was able to use the script strategy in class with minimal disruption to her thinking process.

Environmental strategies

Scheduling changes due to fatigue and reduced attention

- ❑ Shorten school day
- ❑ Schedule core content subjects when the student is most alert (usually in the morning)
- ❑ Designate a place and time for rests

Physical factors

- ❑ Shift classrooms to reduce distance between classes
- ❑ Release student from classes a few minutes earlier to allow for travel time between classrooms
- ❑ Arrange for someone to carry books/backpack
- ❑ Have someone help locate classes
- ❑ Eliminate architectural barriers
- ❑ Adjust lighting, temperature, movement, and noise in a classroom
- ❑ Help reduce distractions by using a study carrel
- ❑ Provide help with lockers
- ❑ Supply an extra set of books for home

Real-life story

Joey, a twelve year old student with a brain injury, required brief rest times during the school day and had trouble walking long distances. His courses in the middle school were chosen partly on the basis of which classrooms were on the main level and grouped together. Core subjects such as English and Math were provided in the morning, while most of his electives were after lunch. Teachers arranged for Joey to provide a subtle signal when he needed to rest and space was designated in the nurse's office for a rest area. He was allowed to leave classes a few minutes early to get to the next class. Different peer "buddies" helped carry books and other materials to each class. Joey was allowed to wear t-shirts and had shorts under his pants so that he would not need to take extra time to dress for gym periods. He used a key-lock for his locker, rather than a combination lock due to memory and fine motor difficulties.

Organizational strategies for learning

- ❑ Use a notebook with all relevant information plus a schedule, calendar, folders, paper, index divisions, homework page
- ❑ Use different colored folders for each subject
- ❑ Use the SQ4R method – survey, question, read, write, recite, review
- ❑ Provide a study sheet, outline of the chapter, teachers' notes to tests and quizzes
- ❑ Use the "WH" strategy – who, what, when, where, why to help focus and organize information
- ❑ Have student or teacher give brief summary (written or orally) after each lesson
- ❑ Teach from concrete to abstract
- ❑ Pre-teach essential vocabulary and highlight main points before introducing new material to help student form a "mental template" for new information
- ❑ Use task oriented checklists with sequentially ordered steps for completing the task

Real–life story

Before a new chapter is introduced in social studies class, Antwan's teacher reviews the important new terms and names that will be mentioned. Together, they look at the review questions at the end of the chapter and discuss what the important points will be in the chapter. Only then is the chapter introduced. Now as Antwan listens to the material, he is better able to know which parts are most important.

Attentional strategies for learning

Directions

- ❑ Use verbal, visual, or physical refocusing
- ❑ Use checklists
- ❑ Modify the amount of information being presented to avoid overload
- ❑ Begin with short directions using repetition
- ❑ Provide comprehension questions prior to the student's reading a passage
- ❑ Encourage working for short segments of time with breaks as needed
- ❑ Break tasks down into manageable components
- ❑ Change intonation to emphasize key words
- ❑ Use readiness phrases before giving directions/information

Appearance

- ❑ Use enlarged work when possible
- ❑ Reduce the amount of visual stimuli on a page
- ❑ Color code to highlight important information

Environment

- ❑ Give preferential seating near the source of information
- ❑ Decrease distractions

Helping the student focus

- ❑ Use a specific routine
- ❑ Use student's interests to enhance attention
- ❑ Shorten class work and homework assignments

Real-life story

Lee has weak attention since his injury, so he sits one row back from the teacher and near peers who are good models of attention. The teacher and Lee have developed a subtle cue that can be used when Lee's attention wanders. Lee is given a few math problems at a time to do independently. The teacher then checks before giving him the next set of problems. Lee and his classmates have access to study carrels when they need a quiet place to work.

Memory strategies for learning

Things that help...

- ❑ Memory book or diary
- ❑ Electronic organizer
- ❑ Calendar
- ❑ Lists – to do now, tomorrow, and next week
- ❑ Watches with timers
- ❑ Homework sheets/homework book
- ❑ Notes in visible places (stick-ups)
- ❑ Daily schedule to recall classes, location, teacher
- ❑ Checklists
- ❑ Tape recorders
- ❑ Low tech to high tech assistive technology devices

Techniques that help...

- ❑ Mnemonic techniques – use the initial letter of words to be recalled and combine them into a meaningful context
- ❑ Repetition (aloud, sub-vocalized or silently)
- ❑ Visual cues and visual mapping for verbal information
- ❑ Consistency and organization – always keep notebook in same place at home
- ❑ Rhyming
- ❑ Provide information more slowly

Teaching strategies to help memory...

- ❑ Associate faces with names
- ❑ Teach how to cluster information (semantically, temporally)
- ❑ Use readiness phrases (i.e., "you need to remember this…")
- ❑ Relate new information to previously learned information
- ❑ Teach student to request repetition
- ❑ Use student's interests to enhance motivation

- ❑ Spiral teaching (frequent review of previously taught information)
- ❑ For test-taking, use the mnemonic
  SCORER
  S –schedule your time
  C – clue words
  O - omit difficult questions
  R – read carefully
  E –estimate your answer
  R – review your work

Real-life story
Jessica carries a memory book that includes her assignment pad, daily schedule, weekly and monthly planner, and important phone numbers. Her teacher supplies her with a copy of class notes so that she does not need to try to listen, remember and decide what to write during lessons.

Visual processing strategies for learning

- ❑ Reduce amount of visual stimuli on a page
- ❑ Use enlarged print
- ❑ Use ruler or note card to assist with visual tracking
- ❑ Use arrows or colored dots to cue for left to right or top to bottom orientation
- ❑ Adjust placement of materials for visual field cuts
- ❑ Give longer viewing time
- ❑ Block off parts of the page not in use
- ❑ Always be mindful of the need to supplement visuals with verbal or hands-on explanations

Real-life story:
Marcus' teacher modifies all written material to make it less visually complex. Print is enlarged and made less dense on the page. She makes sure that she verbally explains any tables, charts or graphs.

Behavioral strategies for learning

Recognize behavioral patterns...

- ❑ Try to determine patterns for when undesired behavior occurs
- ❑ Monitor for excess stimuli, frustration, or social rejection as causes of behavioral problems
- ❑ Monitor for signs of any overload
- ❑ Help student identify "triggers", such as physiological factors that may lead to agitation, (i.e., being hungry or tired)
- ❑ Help student read own and others' body language as a signal of agitation (i.e., rising voice level, pacing around the room, rapid breathing, stomach tightening)
- ❑ Develop a signal for student to use when respite or snack is needed

Teaching style...

- ❑ Break tasks down into smaller parts to reduce frustration
- ❑ Avoid a confrontational approach; that only makes the student more upset
- ❑ Act as a model for controlled behavior
- ❑ Always be clear and consistent in directions and all communications
- ❑ Give immediate feedback about positive and negative behaviors
- ❑ Use videotaping to teach appropriate behaviors and provide corrective feedback
- ❑ Use redirection or refocusing away from the cause of the anger or frustration; shift the student's thinking to another area
- ❑ Offer alternatives to problems that have been the cause of excessive agitation
- ❑ Write down rules to help the student remember them
- ❑ Provide opportunities for academic and social success
- ❑ Encourage ongoing communication among all staff so student has a consistent approach
- ❑ Set clear and concise limits

Environmental modifications

- ❑ Provide a high level of structure in a nurturing environment
- ❑ Reduce excess stimuli or outside distractions
- ❑ Help student identify a quiet place when breaks are needed

Social interactions and support...

- ❑ Use social skill groups to teach skills, provide feedback, and provide successful social experiences
- ❑ Use a "circle of friends" approach to encourage social integration
- ❑ Provide supportive counseling
- ❑ Us a buddy system

Real-life story

John is a 14 year old student with a brain injury who is impulsive and disinhibited. He often invades others personal space, including touching staff, classmates and female peers, making others uncomfortable. After consulting with John's rehabilitation team, which he still saw on an outpatient basis, John's teachers began using verbal and visual cues to make him more aware of when he was invading others personal space. Red (stop), yellow (pause), and green (doing well) cue cards were used to indicate how John was doing.

Chapter 6
Preparing for Life After High School

Most adolescents and older students have goals and plans for the future. For students with brain injury, the steps necessary to achieve these goals and plans may be the same as for any young person, but more complex. The choices are many – continuing education, vocational training, finding a job, or juggling part-time work and classes. This is also the time that many young people first think about moving away from home. The student with a brain injury needs sensitivity and help to develop and achieve goals for life after high school.

A student whose injury happened during childhood has more time to plan than a student injured during the transitioning stages (ages 14 and older). For the recently injured student, the transitions may be harder. Good planning greatly improves the chances that the move from school to adult life will be successful.

Transition services for students with brain injury could include a combination of the following: postsecondary education at a community college or four-year college or university; vocational training and education that could include employment alongside other people with disabilities in a vocational program or employment in the community with a job coach; adult services that could include comprehensive social services that help the student live safely while maintaining as much independence as possible; participation in community life (this could include volunteering) and trade schools.

Services should be based on the student's needs and take into account their strengths, preferences and interests. They may include instruction, related services, community experiences, the development of employment and other adult living objectives and, when appropriate, acquisition of daily living skills and a functional vocational evaluation.

The following questions can help the student plan for the future:

- ❑ What were the student's skills, abilities and interests prior to their injury?
- ❑ What were the student's goals for the future (college, vocational training, etc.)?
- ❑ What impact does the brain injury have on the student's abilities and goals for the future?
- ❑ Is the student eligible for special education and related services within the school? If no, are services through the Division of Vocational Rehabilitation Services an option?
- ❑ What vocational plan can help the student achieve identifiable goals? (The vocational plan includes all cognitive and behavioral strategies, accommodations and types of services that are needed.)
- ❑ Are there funding sources available to achieve the goals?
- ❑ Who is responsible for monitoring the success of the plan – including after high school graduation?
- ❑ What support systems does the student have to achieve a successful outcome?
- ❑ Given the student's current situation and goals, should graduation be delayed?

Delaying graduation

A large number of students with recent brain injuries are adolescents in their junior or senior year of high school. All too often, they are granted a diploma based on their prior academic performance. In many cases, this is ill advised because the student can still benefit from additional education through 21 years of age in order to develop improved cognitive/academic skills and to obtain vocational training.

The student can enroll in a college program or continue on a vocational path and is better prepared for the future. It is important that students not be given a diploma if they can benefit from continued instruction, even if there is only one semester left. In some cases, graduation is appropriate; however, when a moderate or severe brain injury occurs, it may be best to postpone graduation. It is important for the educational and rehabilitation teams, family members and the student to consider the impact of additional programming. If this is the decision, the student may participate in graduation ceremonies with peers, but not receive an "official" diploma at this time.

Chapter 7
In Conclusion…
The Role of the Educator

An educator can have a tremendous impact on the life of a student with brain injury. The educator has the skills and expertise to identify, advocate, and support the student with a brain injury and assist with the coordination of educational supports within the school setting. In addition, the educator plays an important role in the prevention of brain injuries by educating students about the risks for brain injury that are encountered every day. The expectations of educators vary by discipline and may vary from one school district to another. *Advocate, Coordinate, and Educate (A.C.E.)* is a simple way to organize the complex roles of educators involved with any student with a brain injury.

Advocate

An educator has the experience and knowledge to *advocate* for students with brain injuries. Take the case of a student with a mild brain injury.

> **Mild Brain Injury**
> A teacher may be the first person to recognize that there is a sudden onset of academic or behavioral difficulties. The teacher may pick up subtle differences in a student's ability to concentrate, remember new information, or get along with other classmates. The teacher may ask the school nurse to evaluate the student and question parents about a possible injury. With information from the parents about a blow to the head, it is possible to make the connection that the student has symptoms of a mild brain injury requiring intervention. A student with an untreated mild brain injury often loses friends, falls behind in schoolwork, and/or gets "in trouble" at home or in school because the brain injury remains undiagnosed. Educators are in a good position to gather facts that could lead to early intervention.

In addition to advocating for the student with a brain injury, the educator is in an ideal position to *advocate* for brain injury prevention. Successful prevention programs use the three E's approach to prevention: education, engineering, and enforcement.

Programs that focus on the following are all appropriate places to include a message about the importance of protecting the brain from injury:

- 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

Many of these programs are already in the schools, but do not make the connection between "safety" and preventing a brain injury. Educators can implement these programs and ensure that all staff include a message about brain injury prevention every time. The Brain Injury Alliance of Connecticut 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 moderate or severe brain injury returns to school, educators play a vital role *coordinating* a successful reentry. Many students with brain injuries return to school needing classroom modifications. Informed and supportive educators can ease the stress of transition for the student, family and staff. It is important to fully understand the student's level of functioning and needs prior to returning to school, and to discuss this information with other members of the education team.

Educate

There are important areas where educators can help facilitate a successful school experience for a student with a brain injury.

Educating staff about brain injury

When a student with a brain injury is ready to return to school, educators can assist by coordinating an in-service training in consultation with the student's rehabilitation team and a staff person or volunteer from the Brain Injury Alliance of Connecticut. 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 about working with a new and unfamiliar situation. Knowledge about the student's needs and how to accommodate those needs will often alleviate fears.

Educating students about brain injury

Very often it is difficult, particularly for a teacher, to make allowances in the classroom for a student with a brain injury when other students perceive this as favoritism. An educator can help other students understand the medical necessity for allowances, such as periodic rests or breaks for food. Educating peers can also help the student with a brain injury feel more accepted. It is common for students with brain injuries to have decreased self-esteem, which can be exacerbated by students not understanding their deficits. It is important that educators prepare students and offer a comfortable atmosphere for the reentry of a student with brain injury.

The educator plays a vital role in the education of a student with brain injury. By educating staff and students about brain injury, coordinating services, and serving as an advocate, you can create the best possible educational experience for a student with a brain injury.

The Brain Injury Alliance of Connecticut hopes that educators who understand the effects of brain injury and the accompanying consequences will take advantage of every opportunity to assist students with brain injuries, promote awareness about brain injury, and spread the message of prevention. Thank you on behalf of students with brain injuries and their families for your dedication to your profession.

Chapter 8
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 Alliance 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 Alliance of Connecticut and with a parent advocacy group 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 Individualized Education Program (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 Bureau 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 BRS. 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 learning on a 4^{th} – 6^{th} 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 included in general

education classes 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 general education classes with extra support built into his program. His IEP clearly stated what modifications would be made to the general 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.

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

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Rancho Los Amigos Scale of Cognitive Functioning

Level	Child's Response	Suggestions for Parent
I. No Response	Unresponsive • appears to be in a deep sleep • hold a hand • rub lotion on skin Speak calmly and slowly • assume your child can hear • be sensitive to what is said near her	Show affection • kiss your child
II. Generalized Response	Non-purposeful body movement • to pain or touch • to familiar sound or smell	Bring in familiar things • special blanket or stuffed animal • tape recordings of voices or music
III. Localized Response	Localized, specific body movement • 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 • constant movement • thrashing about in bed • extra sensitive to movement, light, noise Confused • may not make sense • very short attention span • may be rude or aggressive • unsafe	Take care of yourself • take a break and get away • accept help Minimize distractions • 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 • memory severely impaired • unable to separate past from present • may wander off Inappropriate • agitated behavior remains • conversations disjointed	Be your child's memory • 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 • 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 • 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 • 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 • 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.

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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.

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

Agnosia: Inability to recognize the signi□cance 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.

Are□exia: Loss of re□ex 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 subjects 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 responsivieness 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 form 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; sterognosis.

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.

Kinesthesis: 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 of 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; excessive 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.

Opthalmoplegia: 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.

Parethesia: 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 physiarists 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 in 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.

Psychosocial: 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.

Quadriparesis: 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.

Spinothalmic 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.

Sublaxation: A partial or incomplete dislocation.

Supraretorial: 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 visiual 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. JuhnWada 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

Academic and Functional Goals: Measurable goals that shall, as appropriate, be related to the core curriculum content standards through the general education curriculum unless otherwise required according to the student's educational needs, or appropriate, student specific, functional needs. For all students, the annual academic and functional goals shall be measurable and apprise parents and educational personnel providing special education and related services to the student of the expected level of achievement attendant to each goal.

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

Approved Private School for Students with Disabilities: An incorporated entity approved by the New Jersey Department of Education to provide special education and related services to students with disabilities placed by the district board of education responsible for providing their education.

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

Assistive Technology Device: Any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of a child with a disability.

Assitive Technology Service: Any Service that directly assists a child with a disability in the selection, acquisition, or use of an assistive technology device.

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

Case Manager: The identified member of the child study team who is responsible for coordinating the development, monitoring and evaluation of the effectiveness of the IEP. The case manager also facilitates communication between home and school and coordinates the annual review and reevaluation process.

Child Study Team (CST): An interdisciplinary group of certified persons, including a school psychologist, a learning disabilities teacher-consultant and a school social worker, who are responsible for evaluating students; participating in the determination of eligibility of students for special education program and service; providing services to the educational staff with regard to techniques, materials, and programs; consulting with and supporting families.

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: An assessment conducted by the Learning Disabilities Teacher-Consultant (LDT-C) to determine a child's academic level of performance, including learning strengths, weaknesses and learning styles.

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

Free, Appropriate Public Education (FAPE): Consists of special education and related services that are provided at public expense under public supervision and direction and without charge to the parents; meet state and federal requirements; include preschool, elementary, or secondary school education; and are provided according to an Individualized Education Program.

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

IEP Team: The group of individuals who are responsible for the development, review and revision of the student's individualized education program.

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.

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): A written plan that sets forth present levels of academic achievement and functional performance, measurable annual goals, and short-term objectives or benchmarks and describes an integrated, sequential program of individually designed instructional activities and related services necessary to achieve the stated goals and objectives. the plan establishes the rationale for the student's educational placement and serves the basis for program implementation.

Individuals with Disabilities Education Act (IDEA): The United States federal law that governs how states and public agencies provide early intervention, special education, and related services to children with disabilities. It addresses the educational needs of children with disabilities from birth through the age of 21.

Learning Disabilities Teacher-Consultant (LDTC): The child study team member who works with students who are experiencing academic difficulty or who have diagnosed learning differences. The LDT-C identifies learning styles, administers, analyzes, and interprets educational tests, reviews other pertinent information, and prescribes specific, appropriate, and practical learning strategies. he/she may also help in the areas of time management, organization and study skills.

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

Least Restrictive Environment (LRE): Sets the standard that, to the maximum extent appropriate, students with disabilities are educated with children who are not disabled. It means that special classes, separate schooling, or other removal of students with disabilities from the general educational environment should occur only when the severity of the disability is such that education in general education classes with the use of supplementary aids and services cannot be achieved satisfactorily.

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

Native language: The language or mode of communication normally used by a person with limited ability to speak or understand the English language. In the case of a student, the native language is the language normally used by the parents. Except that in all direct contact with a student (including evaluation of the child), the native language is the language normally used by the student in the home or in the learning environment. The IEP team shall determine the language of the student.

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: Transportation, and such developmental, corrective, and other suppotive services (including speech-language pathology and audiology services, interpreting services, psychological services, physical and occupational therapy, recreation, including therapeutic recreation, social work services, school nurse services designed to enable a child with a disability to receive a free appropriate public education as described in the individualized education program of the child, counseling services, including rehabilitation counseling, orientation and mobility services, and medical services, except that such medical services shall be for diagnostic and evaluation purposes only) as may be required to assist a child with a disability to benefit from special education.

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: Individual and small group instruction provided to students with disabilities by a certified teacher of students with disabilities. Resource programs may be provided in a general education class or in a pull-out classroom. When a resource program is provided, it shall be specified in the student's IEP.

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: The child study team member who is licensed to administer, analyze and interpret intellectual and psychological tests.

School Social Worker: The child study team member who gathers information regarding the academic, social, and developmental histories to provide background information related 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 Program: A program that serves students who have similar intensive educational, behavioral and other needs related to their disabilities in accordance with their individualized education programs. Special class programs offer instruction in the core curriculum content standards unless the IEP specifies a modified curriculum due to the nature or severity of the student's disability.

Special Education: Specially designed instruction, at no cost to parents, to meet the unique needs of a child with a disability, including (a) instruction conducted in the classroom, in the home, in hospitals, and institutions, and other settings; and (b) instruction in physical education.

Speech-Language Specialist: A professional who is licensed to identify and work with students who are experiencing a speech disorder in articulation, phonology, fluency, voice, or any combination, unrelated to dialect, cultural differences or the influence of a foreign language, an/or a language disorder which adversely affects a student's educational performance.

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.

Transition Services: A coordinated set of activities for a child with a disability that (a) is designed to be within a results-oriented process, that is focused on improving the academic and functional achievement of the child with a disability to facilitate the child's movement from school to post-school activities, including post-secondary education, vocational education, integrated employment (including supported employment), continuing and adult education, adult services, independent living, or community participation; (b) is based on the individual child's needs, taking into account the child's strengths, preferences, and interests; and (c) includes instruction related services, community experiences, the development of employment and other post-school adult living objectives, and, when appropriate, acquisition of daily living skills and functional vocational evaluation.

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 disabilites resulting from brain injuries.
- A brain injury occurs every 23 seconds in this country, and sends 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 times 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).

Traumatic brain injury and children - CT statistics

The Connecticut Department of Public Health prepared a special report on TBI data in 20052007 for the June 10 forum. Each year, on average, 29 Connecticut children and adolescents (birth to 19 years) die from a TBI. There are approximately 480 hospitalizations and 8,100 emergency department (ED) visits due to TBI among the birth -19 age group.

As notable as these data are, statistics underestimate the enormity of the TBI problem.17 They include only those children who die, are hospitalized or who receive care in an emergency room.18 An unknown number are not included in TBI statistics because they are not treated in hospitals, if they receive treatment at all.19

References

Centers for Disease Control and Prevention. *Traumatic Brain Injury in the United States,* October, 2004

State of CT General Assembly – Commission on Children. *Traumatic Brain Injury in Children: CT's Silent Epidemic*, June 22, 2010.

Resources

- **Children & Youth with Special Health Care Needs (CYSHCN)**
  Phone: 800-505-7000
  Website: www.ctunitedway.org/cdi.html
  Children and Youth with Special Health Care Needs Program (ages birth -21) provides comprehensive and coordinated health care for income-eligible children who have, or are at elevated risk for chronic physical, developmental, behavioral or emotional conditions.

- **Parents Available to Help, Inc. (PATH) Parent–to-Parent & Family Voices of CT & CT Family to Family Health Information Center (F2F HIC)**
  Phone: 1-800-399- PATH (7284) or 203-234-9554
  Website: www.pathct.org Email: pathp2pct@pathct.org
  Talk to a Health Information Specialist: They assist families in navigating health care systems, Information, education, training, support and referral services, One to One Connection to a family who has similar needs and experiences.

- **CT Family Support Network (CTFSN)**
  Phone: 1-877-FSN-2DAY (1-877-376-2329)
  Website: www.ctfsn.org/
  The Family Support Network (CTFSN) is a network of families who have children with disabilities. They are parents interested in helping other parents to find the supports they need. Support can include information related to in home support, respite care, health care, child care, accessible transportation, parent networking and support, home and vehicle modifications, assistive technology, inclusive education programs, summer camp, recreation and after school programs.

- **Katie Beckett Waiver/Deeming Waiver/ 2176 Models Waiver Department of Social Services**
  Phone: 1- 800-445-5394 or 860-424-4904
  The Katie Beckett Waiver enables individuals with severe disabilities to be cared for at home. The income and assets of legally liable relatives (parent) are typically counted when the person with the disability is cared for at home. However, this waiver was developed to allow parents to access Medicaid for their child with a disability or medical needs without having to financially qualify for Medicaid. Eligibility: Individuals with severe disabilities age 21 or younger; Individual's income must be at or below 300% of SSI; Asset limit is $1000; legally liable relative's income is waived.

Educational Resources

- **CT Parent Advocacy Center (CPAC)**
  Phone: 1-800-445-2722 Email: cpac@cpacinc.org
  Website: www.cpacinc.org
  The CT Parent Advocacy Center, Inc. (CPAC) is a statewide nonprofit organization that offers information and support to families of children with any disability or chronic illness, age birth through 26 in addressing educational support. Services are free.

Educational Resources Cont.

- **Disability Rights Connecticut**,
  Phone: 860-297-4300
  Case Services Advocates and Attorneys implement federal and state Protection & Advocacy mandates to protect the rights of adults and children with disabilities & to intervene on behalf of children with disabilities who are receiving special education services and are experiencing difficulty obtaining relevant educational supports.

- **State Education Resource Center (SERC)**
  Phone: 860-632-1485
  Website: http://ctserc.org/s/
  SERC is a nonprofit agency primarily funded by the CT State Department of Education. SERC provides information dissemination in the latest research and best practices to educators, service providers, and families throughout the state.

- **LEARNet**
  Website: http://projectlearnet.org/project_learn.html
  LEARNet is a resource for teachers, clinicians, parents, and students. LEARNet is an interactive web-based problem-solving program designed to enable families and school staff to create effective intervention and support plans for students with Acquired brain injury/ Traumatic brain injury.

- **Brain Injury Alliance of Connecticut (BIAC)**
  Phone: 1-800-278-8242 or 860-219-0291
  Website: www.biact.org
  BIAC can assist in facilitating a smoother Hospital to School transition after a child sustains a brain injury. BIAC offers outreach and education and can do a general presentation in the school for the students in the classroom and/or for the educational professionals on brain injury. Call the BIAC Helpline at 800-278-8242.

- **Center on Post Secondary Education**
  Website: http://cped.uconn.edu/
  Lists Connecticut Resources for Assessment Services For a listing of Disability Services contacts on the CT college and universities go to:
  http://cped.uconn.edu/learning-disability-ld-and-disability-services-ds-contact-personsfor-students-on-connecticut-college-and-university-campuses/

- **Gateway Community College Step Forward Programs**:
  Contact for Step Forward is: Jaime French, Director 203-285-2505
  jfrench@gatewayct.edu
  A 10-month transition program for young adults (18-21) with mild cognitive disabilities. This non-credit program focuses on interpersonal communication skills, career exploration and workplace readiness. In addition to classroom instruction, students are placed in a community or campus-based work experience. Topics covered in the Step Forward I program may include vocational exploration & career planning, job search essentials, personal finances, interpersonal & workplace communications, self-advocacy & disability awareness, and nutrition & fitness. There is a follow up Step Forward 2.

200 Day Hill Road • Suite 250 • Windsor, CT 06095