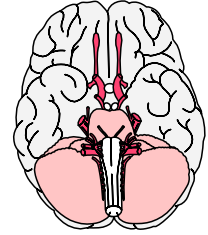


## TRAUMATIC BRAIN INJURY



### DEFINITION:

Traumatic brain injury (TBI) is injury caused to the head that results in minor to serious brain injury. It is caused by either an open head injury where there is a penetrating lesion or closed head injury (most common) where there is no outward injury. Characterized by permanent brain damage caused by concussion, contusion, or hemorrhages. Student's with TBI have similar psychomotor profiles of persons with Cerebral Palsy.

### LEVELS OF TBI:

**Minor:** Common bump to the head with no evidence of concussion. Generally not seen by a physician.

**Mild:** Brief loss of consciousness, if any, with accompanying symptoms of concussion, such as vomiting, lethargy or lack of recall of the injury.

**Moderate:** Evidence of concussion; loss of consciousness for less than 5 minutes.

**Severe:** Concussion or skull fracture; loss of consciousness for 5 to 30 minutes.

**Serious:** Loss of consciousness for more than 30 minutes; concussion or skull fracture and noticeable neurological soft signs (complicate behavioral, perceptual and motor performance).

The term sequelae, refers to the alteration of sensation, perception, emotion, cognition and motor function. The extent of difficulties in attention, memory, and visual motor behaviors varies widely depending on location and nature of the damage, as well as, age.

### COMMON CAUSES OF TBI:

- Motor vehicle accidents
- Falls
- Bicycle accidents
- Child abuse injuries
- Assaults
- Sport injuries

TBI is currently the leading cause of disability for persons under age 35. Typically over half of children with TBI have some degree of permanent spasticity and/or ataxia (types of CP). Sensorimotor Intergration of the tactile, kinesthetic, vestibular, and visual input is particularly affected. Post Traumatic Amnesia (PTA) often occurs and is a good predictor of future function.

#### **COMMONLY USED MEDICATIONS:**

- Methylprednisolone
- Phenobarbital
- Navane
- Valium
- Dilantin
- Dantrium
- Thorazine
- Lasix
- Codeine
- Haldol
- Ritalin
- Tegretol
- Elavil
- Mannitol
- Solumedrol

Symptoms may be masked and caution must be taken when exercising if the student is on medication.

#### **COMMON CHARACTERISTICS OF TBI:**

- Excessive muscle tone-stiff, spastic muscles limiting the range of motion and mobility
- Difficulties due to hemiplegia (i.e., student may be affected on one side of the body).
- Disturbance or lack of balance and coordination – or ataxia, which limits agility
- Visual motor deficits may have problems with depth perception
- Cognitive difficulties (i.e., memory and sequencing deficits, and decreased attention span)
- Abnormal reflexes and decreased fine motor ability
- Speech apraxia (i.e., receptive and expressive language disorders)
- Inappropriate social skills
- May show a lack of judgment
- Change in personality behaviors (i.e., lack of initiation, impulsiveness, or agitation)
- Seizure disorders which may require medication control
- Thermoregulation disorders (i.e., may not adjust to temperature changes sufficiently)

Students with TBI often suffer with reflex, balance, and muscle tone disorders. However, recovery from motor involvement is typically better than from cognitive and behavioral sequelae.

#### **TEACHING TIPS AND SPECIAL CONSIDERATIONS:**

- Each case must be considered and developed based on the individual's needs.
- Program goals based upon what is achievable for the level of the head injury.

- Provide handouts of rules when learning a new game.
- Monitor the student if taking any medication for seizures (collaborate with parents).
- Provide protection equipment and safe landing or stopping points.
- Use caution with activities involving balance.
- Scheduled rest periods are needed.
- Monitor the student's agitation and frustration levels during activities.
- Avoid activities involving contact or could lead to contact with the head.
- Avoid activities such as quick, jumping movements (may cause muscles to spasm).
- Allow extra time and a wider area on agility exercises.
- Use repetition and provide frequent reinforcement and feedback.
- Use bright and contrasting objects when used as targets.
- Use visual demonstrations and physical prompts when possible.
- Develop cue words to help student key in on specific points.
- Keep success oriented activities to a maximum to decrease fear of failure.
- Reinforce language and speech during physical education activities. Consult with speech and language specialist on communication boards and/or American Sign Language.
- Ask open-ended, as well as, yes-no questions and allow ample time for responses.
- Be sensitive to student's frustration when a message is difficult to convey.
- Provide the student with a signal to alert teacher of an emergency.
- Persist in finding out what is being said by the student when it is difficult to understand.
- Never assume a person with intelligible speech has mental retardation. Too often, students with TBI are placed incorrectly in programs designed for students with mental retardation, rather than in those designed for students with learning disabilities.
- Anticipate impulsive behavior and provide students with a structured environment, with behavior limits already set.
- Provide contained choices and use questioning to review the rules of an activity.
- Be aware that some students with TBI may not be able to adjust from one temperature extreme to another.

### **SUGGESTED ACTIVITIES:**

*Collaborate with parents and medical personnel (with parent's permission) on determining particular contraindicated activities.*

- Emphasize slow, static stretching
- Strength training for large and small muscles
- Conscience relaxation exercises
- Specific body awareness activities
- Activities involving role playing to help develop appropriate social skills and acceptable ways to exhibit frustration
- Nonverbal games and activities

- Movement exploration with hierarchy of cues to encourage self-direction
- Activities designed to teach self-monitoring techniques
- The U.S. Cerebral Palsy Athletic Association (USCPAA) serves athletes with Cerebral Palsy type difficulties that have average or above, intelligence. Athletes with mental retardation commonly participate in Special Olympics programs.

*Information on this sheet contains only suggested guidelines. Each student must be considered individually, and in many cases, a physician's written consent should be obtained.*