



Teachers' Desk Reference: Practical Information for Pennsylvania's Teachers

Concussion (Mild Traumatic Brain Injury)

This *Teachers' Desk Reference* provides information about traumatic brain injury (TBI), specifically concussion, and the potential effects of TBI on a student's behavior and academic performance. A concussion is a mild traumatic brain injury. According to the Centers for Disease Control and Prevention (CDC), during the last decade, emergency department visits for sports- and recreation-related TBIs, including concussions, among children and adolescents increased by 70 percent. Children and adolescents are among those at greatest risk for concussion, and they take longer to recover from brain injury than adults. At some point during your teaching career, it is likely that you will teach at least one student who has sustained this type of mild traumatic brain injury.

Signs and Symptoms of Concussion

A concussion is a type of brain injury that changes the way the brain normally works. The term concussion is derived from the Latin word *concutere*, which means, "to shake violently." Following a concussion, the brain's cells undergo chemical and metabolic changes, called the "neurometabolic cascade of concussion," which

interrupts normal brain function. **The CDC reports that half a million children and adolescents are seen in emergency departments (ED) for traumatic brain injuries each year. Many more occur and are never diagnosed at the ED.** Concussions can occur during contact and noncontact activities, such as organized sports, play time, recess, or physical education class. Concussions can also occur if there is enough external force to jolt the body, without directly hitting the head, causing the brain to move rapidly inside the skull. An

example of this is the jolting caused by seatbelt restraint as a result of a car accident. Even an apparent mild hit to the head can be very serious.

Signs and symptoms of concussion can show up immediately or may not appear until hours or days after the injury. Many students report experiencing diminished mental energy, becoming cognitively fatigued more easily. This is because the concussed brain has to work hard to recover.

Following a concussion, students must complete the Return to Learn process before Return to Play. This means full-day school attendance with no academic supports in place due to concussion symptoms.

There are four main categories of symptoms following concussion:

- Thinking and Remembering
- Physical
- Emotional
- Sleep

All students with a concussion, regardless of whether they are athletes or nonathletes, need to be managed academically upon return to school. Teachers, school professionals, and parents should be alert for any of the following signs or symptoms that were **not present prior** to the student hitting or jolting his or her head. The presence of one symptom can signify a concussion.

Symptoms Commonly Reported by School Professionals

Initial Signs or Symptoms Observed After Trauma to the Head

The student:

- Appears dazed or stunned
- Can't recall events **prior** to the hit, bump, or fall
- Can't recall events **after** the hit, bump, or fall
- Loses consciousness (even briefly)
- Moves clumsily

In-class Behaviors

The student:

- Exhibits behavior or personality changes
- Answers questions slowly
- Repeats himself/herself
- Is forgetful
- Displays confusion about daily schedule, assignments, environment
- Is unable to cope with stress or stressful events
- Is more emotional than usual

Symptoms Commonly Reported by the Student

Physical Changes

The student:

- Experiences a headache or "pressure" in the head
- Becomes dizzy or lightheaded
- Vomits or has nausea

- Loses balance, drops things, trips
- Feels worn out or exhausted, tires easily
- Becomes sensitive to light or noise
- Experiences blurry or double vision
- Experiences ringing in the ears
- Does not "feel right"
- Experiences numbness or tingling

Thinking and Remembering Changes

The student:

- Feels confused or "foggy"
- Mixes up time and/or place
- Has lower attention or concentration
- Is daydreaming more than usual
- Has difficulty completing homework
- Has difficulty organizing thoughts, words, materials
- Misunderstands
- Reacts and responds slowly
- Thinks slowly
- Is forgetful, has difficulty with memory
- Has trouble remembering to do things on time
- Experiences difficulty learning new concepts or ideas
- Has difficulty making decisions
- Has difficulty planning, starting, doing, and finishing a task

Emotional Changes

The student:

- Feels restless or irritable
- Is impulsive
- Becomes easily upset and/or loses temper
- Feels sad or depressed
- Feels anxious or nervous
- Experiences mood swings
- Feels more stressed than usual

Sleep Changes

The student:

- Feels drowsy during the day
- Sleeps **less** than usual
- Sleeps **more** than usual
- Has trouble falling asleep
- Experiences restless sleep

Potential Impact on Class Performance

Concussions are invisible* injuries that suddenly impact a student's typical thinking, learning, and behavior. Classroom teachers and school nurses are often the first educational professionals to notice these changes in a student. The symptoms a student experiences that impact thinking and recall, as well as physical and emotional well-being, may impact the student's academics temporarily, and in some cases permanently. It is important to recognize the signs of concussion and to understand how to assist a student's recovery while at school by utilizing proper academic adjustments across all settings.

The student should be medically evaluated and follow treatment recommended by a health care provider who has experience in managing concussions. This treatment may include resting at home for the first few days after concussion occurs.

Homebound is contraindicated for the great majority of students following concussion. Although, in a small number of cases, it may be medically necessary due to symptom severity. In these rare cases, the school should work closely with the health care provider. The health care provider can determine what is medically impacting recovery and the school can determine what academic adjustments can be put in place to support the return to school. The majority of concussions (70%) resolve within 4 weeks; however, for up to 30 percent of students,

All academic adjustment/accommodation decisions following a concussion are the responsibility of the school team. If health care provider input is available, it should be taken into consideration, but final decisions are determined by the school, based on student need and presenting school day symptoms.

symptoms may linger for months and, in a very small percentage, a lifetime. If a student does not recover within 4 to 6 weeks, the student should be referred to the BrainSTEPS Program for local assistance with individualized academic adjustment selection, consultation, and training. If the student continues to remain symptomatic beyond 6 to 8 weeks, the LEA should consider whether the student's academic or behavioral needs warrant ongoing adjustments or whether an evaluation should be conducted by the LEA to determine the need for more formal, intensive accommodations and/or modifications. If further formal educational supports are thought to be necessary, a referral for a multifunctional evaluation should be made.

Once the concussed student returns to school, the LEA should employ academic adjustments to enable the student to remain in school below his/her individual symptom threshold, while alleviating cognitive overexertion, so the brain recovers. Concussion management should be thought of in two very different time periods: Those students who recover within 4 weeks and those who do not.

Initially (typically 1 to 4 weeks):

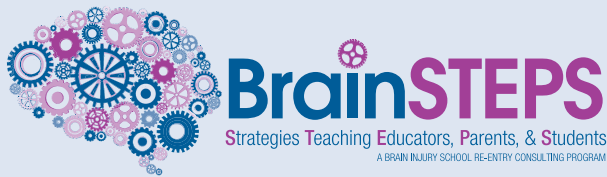
Encouraging the student to "push through" symptoms, rather than managing symptoms, can prolong recovery and intensify symptom severity.

After (typically 4 to 6 weeks and beyond):

Over time, it is crucial to gradually increase a student's cognitive activity levels while monitoring the student to ensure that symptoms are not significantly intensifying. Beyond the initial weeks, if the student becomes very symptomatic (escalating several points on a symptom severity scale) with increased cognitive activity, cognitive activity should be reduced.

- If the student experiences light symptoms (1 to 2 point increase on a symptom severity scale), the student should continue working, and the teacher should continue to monitor symptoms.
- If a student has not recovered in 4 weeks, it is important that the parents involve a health care provider who is trained in concussion management to identify whether a medical and/or psychological issue is impeding

*Concussed individuals tend to look physically normal; however, each person is unique in their recovery and manifestation of symptoms. It is important to remember one cannot "see" symptoms such as a headache, fatigue, light and noise sensitivity.



Annually in Pennsylvania, approximately 4,000 children sustain moderate to severe traumatic brain injuries, which are significant enough to require hospitalization. Each year, over 20,000 children sustain concussions in Pennsylvania. Acquired brain injuries include any injury to the brain that is sustained after birth, and includes all traumatic brain injuries (injury is caused by an external force and includes concussions) and nontraumatic brain injuries (e.g., strokes, tumors, seizures, aneurysms).

Pennsylvania's BrainSTEPS (Strategies Teaching Educators, Parents, and Students) Brain Injury School Re-Entry Consulting Program has been designed to consult with school teams and families in the development and delivery of educational services for students who have experienced any type of acquired brain injury. BrainSTEPS was created in 2007 by the Pennsylvania Department of Health and is funded jointly by the Pennsylvania Department of Health and the Pennsylvania Department of Education, Bureau of Special Education. BrainSTEPS is implemented through the Brain Injury Association of Pennsylvania to work with students who have sustained a new, acquired brain injury, as well as with students who

have been previously identified as having an acquired brain injury and who may begin to develop educational effects over the years as the brain matures and develops.

- BrainSTEPS teams are based out of the intermediate units across the state. BrainSTEPS consultants are available to provide various brain injury presentations to educational professionals in Pennsylvania. Training opportunities offered include:
 - Student specific brain injury training for district teams
 - LEA in-service training on all severities of acquired brain injuries and resulting educational impacts
- BrainSTEPS consultants provide training and consultation to school teams and families pertaining to:
 - Identification and management of acquired brain injury symptoms within the school setting, utilizing accommodations and modifications
 - School re-entry planning
 - IEP and 504 development
 - Intervention selection and implementation
 - Annual, ongoing monitoring of students until graduation.

The BrainSTEPS Program: www.brainsteps.net

recovery (e.g., ocular, vestibular, anxiety/depression). This information should then be communicated with the school so academic adjustments can be put in place to further support the identified issue during the school day.

Typical Academic Adjustments Based on Presenting Symptoms

The following are common concussion academic adjustments that should be considered during the initial weeks of recovery to alleviate cognitive fatigue and facilitate the cognitive rest needed for recovery.

- The student should be medically managed by a physician who is experienced in the management of concussions.
- The student should not participate in physical education, sports, or physical activity

during recess until the student is medically cleared. The risk of sustaining a second concussion before the first concussion has healed can have devastating long-term consequences, such as long-term disability.

- Mental work should never be substituted for physical activity (such as during physical education or recess).
- Standardized tests should be avoided during the initial weeks post-concussion, while the student is symptomatic.
- Tests should be delayed if scheduled during the initial 1 to 2 week(s) post-concussion.
- The student should be required to complete only one test or quiz per day, as tolerated. Increase over time.
- Automatically built-in rest periods in a quiet area may need to be added to the student's daily schedule.

- Additional time should be provided for the student to complete homework and classwork.
- All assignments should be provided to the student in writing.
- Assignments should focus on essential key content while student is recovering. Remove nonessential classwork/homework.
- Assignments should not be repetitious. Once a concept has been mastered, grade the work that the student has completed. Fifty percent of the student's typical workload is often times recommended during recovery (for example, the student would be responsible for completing 25 of the 50 math problems assigned).
- Provide the student with alternatives to written output for tests, assignments, projects.
- Encourage the student to use word banks, timelines, calculators, and open notes/book.

Sensitivity to Light, Sensitivity to Noise, and Headaches

- Allow the use of sunglasses or ball caps to shield light.
- Seat the student in a dim area of the classroom, away from windows.
- Allow the use of headphones/earbuds to block noise.
- Temporarily excuse the student from loud classes (e.g., music, shop, band).
- Provide a quiet environment for the student to eat lunch with friends (e.g., nurse's office, guidance office).
- Give the student prior notice for a fire drill, tornado drill, etc.
- Provide the student with copies of teacher notes when notes are presented using Power Point, a projector, or a SmartBoard.

Dizziness

- Allow the student extra time to get to class before the halls become busy.
- Ask a peer to walk with the student.
- Have a peer carry the student's books to and from class.

- Allow the student to use the elevator, if available.
- Provide the student with teacher notes to prevent up and down shifting of the student's eyes; and, have the student follow along with a highlighter for key concept recognition.

Fatigue

- Build strategic rest breaks into the student's schedule, not just as needed. Provide a 5 to 10 minute break every 30 to 45 minutes, initially, to alleviate fatigue. Allow the student to put his or her head down on desk or rest his or her eyes.
- The student may initially require a half-day modified schedule in the morning or afternoon, dependent upon the level of fatigue.
- The student may only be able to attend school for 1 to 2 core classes or 1 to 2 specials initially.

The Local Educational Agency's Role in Student Recovery

- Ensure that teachers have a solid understanding of how concussions impact classroom performance. BrainSTEPS consultants are available to conduct LEA training and student-specific training.
- Establish an LEA response to concussion by adopting the BrainSTEPS *Concussion: Return to Learn Protocol* and establishing a Concussion Management Team with the assistance of the regional BrainSTEPS team.
- Allow the student to use academic adjustments to alleviate cognitive fatigue and facilitate cognitive rest, so the brain can heal.
- Facilitate consistent contact with the family, student, teachers and physician during recovery.
- Make a referral to the BrainSTEPS Program if a student is 4 to 6 weeks post-concussion and is still experiencing symptoms or if the student's classroom performance and/or attendance has been impacted. Referrals to BrainSTEPS can be made earlier if a student has a concussion that is not progressively resolving during the first several weeks, or if

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the student has a history of any of the following “concussion modifiers”:

- Prior concussion(s)
- Migraine headaches
- Anxiety, depression or other mental health issues
- Attention deficit hyperactivity disorder (ADHD)
- A learning disability
- Sleep disorders

How to Make a BrainSTEPS Student Referral for Consultation and Training

The BrainSTEPS Program works with students who have sustained any severity of acquired brain injury. Students can be referred to the BrainSTEPS Program at any point until graduation, if the injury is causing educational impacts by following these steps:

1. Go to the BrainSTEPS website: www.brainsteps.net
2. Click on “Make a Student Referral” link on the top right side of the page.
3. Input the required information.
4. Click SUBMIT.
5. The BrainSTEPS team will be in contact with the parent, typically within 48 hours.

Review

As a classroom teacher, you should be aware of the basic facts about concussions, as well as the physical, cognitive, and emotional signs that may become apparent in a student who has sustained a concussion:

- All concussions are serious.
- Concussions can occur without directly hitting the head.
- Chemical and metabolic changes occur in the brain during a concussion, interfering with normal brain activity.
- Most concussions (90 percent) occur without loss of consciousness.

- Concussions are not like short-term illnesses (e.g., the flu). During this acute period of rest, teachers should not send missed work home. Initially, if a student is home for a period of time following concussion, it is to ensure that cognitive rest occurs. Light cognitive activity such as television, texting, video games, studying, homework or reading can occur as long as they do not cause symptoms.
- Expecting a student with a concussion to complete typical school work and homework can result in a significant increase in symptoms and delay the recovery process. Cognitive overload causes cognitive fatigue. Cognitive overload impacts recovery timelines for students.
- Upon return to school, it is critical that the student focus on new learning and not missed work, due to the potential for prolonging recovery by inducing cognitive fatigue.
- Prior conditions or underlying conditions such as attention disorders, learning disorders, and emotional disorders tend to be exacerbated by a concussion.
- Be aware that many students with lingering concussion symptoms may develop symptoms of depression and/or anxiety. If a student is still experiencing symptoms after 4 weeks, the LEA should screen for depression/anxiety.
- Pushing through concussion symptoms such as headache and fatigue during the initial weeks can potentially prolong recovery and increase symptom severity.
- The Pennsylvania Department of Education, Bureau of Special Education, in conjunction with the BrainSTEPS Program, has created a step-by-step *Concussion: Return to Learn Protocol*, which is available to assist LEAs in Pennsylvania.

Following a concussion:

- Clearance to return to “cognitive activity” from a health care provider is not required.
- Clearance to “return to school” from a health care provider is not required.

- Homebound is contraindicated for the great majority of students following concussion. Although in a small number of cases it may be medically necessary due to symptom severity. In these rare cases, the school should work

closely with the health care provider. The health care provider can determine what is medically impacting recovery and the school can determine what academic adjustments/supports can be put in place to assist with the return to school.

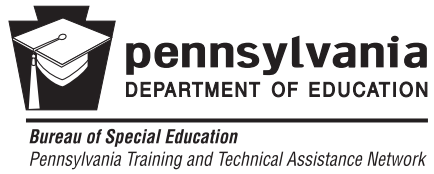
Information included in this *Teachers' Desk Reference* was adapted from published work by the U.S. Department of Health and Human Services: Centers for Disease Control and Prevention. www.cdc.gov/concussion/HeadsUp/schools.html

For further BrainSTEPS Program information or to discuss setting up a Concussion Management Team supported by BrainSTEPS within your district, please contact:

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