

## **What is a Concussion?**

A concussion is a disturbance in brain function that occurs following either a blow to the head or as a result of the violent shaking of the head.

In the United States, the annual incidence of sports-related concussion is estimated at 500,000. Estimates regarding the likelihood of an athlete in a contact sport experiencing a concussion may be as high as 19% per season. Although the majority of athletes who experience a concussion are likely to recover, an as yet unknown number of these individuals may experience chronic cognitive and neurobehavioral difficulties related to recurrent injury.

## **What are the Common Signs and Symptoms?**

Signs observed

- Appears to be dazed or stunned
- Is confused about assignment
- Forgets plays
- Is unsure of game, score, or opponent
- Moves clumsily
- Answers questions slowly
- Loses consciousness (even temporarily)
- Shows behavior or personality change
- Forgets events prior to hit (retrograde amnesia)
- Forgets events after hit (anterograde amnesia)

Symptoms reported by athlete

- Headache
- Nausea
- Balance problems or dizziness
- Double or fuzzy vision
- Sensitivity to light or noise
- Feeling sluggish
- Feeling "foggy"
- Change in sleep pattern
- Concentration or memory problems

## **Loss of Consciousness**

In a University of Pittsburgh Medical Center (UPMC) study of high school and college athletes with concussion, on-the-field amnesia, not loss of consciousness, as long thought, was predictive of post-injury symptom severity and neurocognitive deficits.

Upon ruling out more severe injury, acute evaluation continues with assessment of the concussion. First, the clinician should establish the presence of any loss or other alteration of consciousness (LOC). LOC is relatively rare and occurs in less than 10% of concussive injuries. The identification of LOC can be very tricky as the athlete may lose consciousness very briefly, and this event may not be directly observed by others. By definition, LOC represents a state of brief coma in which the eyes are typically closed and the athlete is unresponsive to external stimuli. LOC is most obvious when an athlete makes no attempt to brace his or her fall following a blow to the head. Any athlete with documented LOC should be managed conservatively, and return to play is contraindicated.

## Post-Concussion Syndrome

Although the majority of athletes who experience a concussion are likely to recover, an as yet unknown number of these individuals may experience chronic cognitive and neurobehavioral difficulties related to recurrent injury. Such symptoms may include chronic headaches, fatigue, sleep difficulties, personality change (e.g. increased irritability, emotionality), sensitivity to light/noise, dizziness when standing quickly, and deficits in short-term memory, problem solving and general academic functioning. This constellation of symptoms is referred to "Post-Concussion Syndrome" and can be quite disabling for an athlete. In some cases, such difficulties can be permanent and disabling. In addition to Post-Concussion Syndrome, suffering a second blow to the head while recovering from an initial concussion can have catastrophic consequences as in the case of "Second Impact Syndrome," which has led to approximately 30-40 deaths over the past decade.

### How can you prevent a concussion?

To reduce the chances of sustaining a concussion, patients should be advised to:

- Wear a seat belt every time they drive or ride in a motor vehicle.
- Buckle their child in the car using a child safety seat, booster seat, or seat belt (according to the child's height, weight, and age).
  - Children should start using a booster seat when they outgrow their child safety seats (usually when they weigh about 40 pounds). They should continue to ride in a booster seat until the lap/shoulder belts in the car fit properly, typically when they are 4'9" tall.
- Never driving while under the influence of alcohol or drugs.
- Wear a helmet and make sure their children wear helmets when:
  - Riding a bike, motorcycle, snowmobile, scooter, or all-terrain vehicle
  - Playing a contact sport, such as football, ice hockey, or boxing
  - Using in-line skates or riding a skateboard
  - Batting and running bases in baseball or softball
  - Riding a horse
  - Skiing or snowboarding
- Ensure that during athletic games and practices that they themselves and their children:
  - Use the right protective equipment
  - Follow the rules for safety and the rules of the sport
  - Practice good sportsmanship
  - Do not return to play with a known or suspected concussion until they have been evaluated by an appropriate health care professional and given permission to return to play.
- Maintain a regular physical activity program, if their health care provider agrees, to improve lower body strength and balance.
- Make living areas safer for seniors, by:
  - Removing tripping hazards such as throw rugs and clutter in walkways
  - Using nonslip mats in the bathtub and on shower floors
  - Installing grab bars next to the toilet and in the tub or shower
  - Installing handrails on both sides of stairways
  - Improving lighting throughout the home
- Make living areas safer for children, by:
  - Installing window guards to keep young children from falling out of open windows
  - Using safety gates at the top and bottom of stairs when young children are around
- Make sure the surface on their child's playground is made of shock-absorbing material, such as hardwood mulch or sand.

## **How do you diagnose a concussion?**

Diagnosis is made based by a health care provide based on the history of the events and the patient's physical symptoms. Concussions symptoms can be similar to other illnesses therefore it is important to have you child be seen by your provider within 48 hours after a head injury.

## **How do you treat a concussion?**

A concussion is a functional brain injury, meaning your brain is structurally intact but the brain cells are damaged. In order to heal from a concussion your brain needs to rest or "shut down". This requires your child to limit both physical and mental exertion. If your child suffers a head injury while playing a sport it is imperative that your child does not return to play in that game. The child should rest and be evaluated by our office within 72 hours of the injury. Returning to play too soon after injury puts your child at risk for significant brain injury or second impact syndrome. Suffering a second blow to the head while recovering from an initial concussion can have catastrophic consequences as in the case of "Second Impact Syndrome," which has led to approximately 30-40 deaths over the past decade.

Prior to evaluation, parents need to limit the child's physical and mental exertion, which includes no t.v, computers, texting, movies, hot tubs, going up and down stairs, walking the dog, running, going to the mall or the store. It is preferred that the child remain in a low stimuli room, i.e. dimly lit, no extraneous noise, where the child can rest, until evaluated by our team.

## **How do you determine when it is safe to return to sports?**

Your provider will do a complete physical exam and if your child is 10 or older, your child will take a computer based neuro-cognitive test called ImPACT. Your child will be safe to return to play when three criteria have been met:

- No symptoms at rest
- No symptoms with activity
- Normal or near normal neuro-cognitive testing on ImPACT

## **What is ImPACT?**

ImPACT (immediate post assessment concussion tool) was developed by the University of Pittsburg Medical Center to assist health care providers on when it is safe for student-athletes to return to play. The test measures your child's reaction time, processing time, verbal and visual memory as well as their symptoms. It is used by many major league organization, (MLB,NHL,NFL) along with the NCAA, multiple high schools and local youth organizations. It is research based and is best used with a baseline so that the provider can compare the results pre and post head injury. Currently it is approved for children 10 and up. It is a computer test that takes approximately 20 minutes to complete.

## **ImPACT testing at Center for Advance Pediatrics**

### **Baseline testing:**

- Performed in either the Norwalk or Darien office.
- The test is scheduled as a nurse visit, the child does not see a provider.
- Our certified ImPACT consultant will review each test for validity.
- The test takes approximately 20 minutes.
- Costs is \$35.00 and is not covered by insurance.
- It is available to patients in and out of our practice who are 10 and up.

- The test must be repeated every two years, due to active cognitive growth in this age group.

**Post-Injury ImPACT testing:**

- Once injured and initial on field evaluation or if deemed necessary emergency room evaluation has occurred, the child/teen should be seen in our office 72 hrs after the injury.
- During this visit a comprehensive, physical exam will be performed and the ImPACT test will be administered, depending on the evaluation by the practitioner.
- Detailed education and counseling will be provided, with written management plan for home and school.
- The concussed child will be seen in the office every 7-10 days to manage their concussion.
- Out of practice patients will have a consultation letter sent to their primary care provider informing them of the diagnosis, treatment and plan of care.

**Helpful websites:**

[www.impacttest.com](http://www.impacttest.com)

[www.sportconcussion.org](http://www.sportconcussion.org)

[www.cdc.gov/concussion/index.html](http://www.cdc.gov/concussion/index.html)

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