



Concussions in Young Athletes

BY: David L. Marshall, MD

In the 2007-2008 school year, one hospital reported that 137,000 concussions occurred in high school athletes, with football being the highest (70,000). Girl's soccer (24,000), boy's soccer (17,000) and girl's basketball (7000) ranked second, third and fourth, respectively. Realistically, the number of concussions actually reported is probably only a fraction of the number of concussions actually occurring. In fact, it has been estimated by the CDC that 1.6 – 3.8 million sports-related concussions probably occur each year. Most of these concussions go unreported for several reasons. First, the athlete may not report his or her symptoms to a coach or trainer for fear he or she may be taken out of the game or labeled "soft." Another reason is the athlete may not know he or she suffered a concussion because the symptoms were thought to be mild: brief dizziness and mild headache. Since there was no loss of consciousness, the athlete and/or coach may feel this is not a concussion. The truth? Brief symptoms such as dizziness, memory loss, feeling in a fog, and headache following a blow to the head **is a concussion.**

What is a concussion?

A concussion is a short-lived impairment of neurologic function caused by a blow to or around the head. The symptoms may last from minutes to weeks to months. One does not have to lose consciousness to have a concussion. In fact, most concussions are not associated with loss of consciousness.

How does one know if he or she has suffered a concussion?

The diagnosis of a concussion is made on clinical grounds, or by the symptoms an athlete exhibits after a blow to the head. The most common symptoms are: headache, feeling slowed down or "foggy," difficulty concentrating, dizziness and fatigue. Other symptoms may include visual problems, sensitivity to light and noise, memory loss and balance problems. The symptoms are caused by a metabolic disturbance in the brain, not a structural

injury. In a concussion, the brain is stressed and the brain cells, called neurons, undergo rapid metabolism to try and recover from the injury.



Does brain imaging (CT or MRI) help in diagnosing a concussion?

No. Because a concussion is a functional injury and not a structural injury, imaging studies are normal. They may be used to rule other problems such as skull fracture, bleeding in the brain, tumors, etc.

How are concussions treated?

The most important thing in treating a concussion is recognizing what has occurred. Once a young athlete suffers signs of a concussion, they should not be allowed to return to play that day and referred for medical evaluation. The evaluation consists of a full history of the events surrounding the injury, a past history of concussions, a complete neurological exam, and possibly imaging

studies to rule out other causes of the symptoms. A new and very important part of the evaluation involves a 30 minute computer based neurocognitive test, called ImpACT, that tests the brain's ability to process, store and recall information. This is available at Children's Orthopaedics of Atlanta through the Sports Medicine Program at Children's Healthcare of Atlanta. Please call the Concussion Clinic hotline at 404.785.5998 for more information about ImpACT testing. The ImpACT test may be administered at weekly intervals until full recovery is achieved.

When can an athlete return to play following a concussion?

It is important to realize that return to play following a concussion is not based on time, but resolution of all symptoms, both at rest and after resuming exertion, as well as normalization of ImpACT scores. This may take a few days or a few months. The average time it takes a young athlete to recover from a concussion is 1-2 weeks. Once the athlete is asymptomatic at rest, then a slow, graded return to physical exertion is implemented starting with slow, low-impact aerobic exercise. As long as symptoms do not return, the exercise intensity is increased to maximum, but no contact. If the symptoms remain absent at maximal exertion and ImpACT scores have normalized, then the athlete is allowed to return to full contact, with close observation and follow-up.

Should an athlete attend school while recovering from a concussion?

Remember that with a concussion, the brain is very metabolically active, trying to recover. If the athlete attends school, the brain is not able to "rest" from a cognitive standpoint, and may take longer to recover. Therefore, athletes who have suffered a concussion and have symptoms should stay home from school and avoid reading, video games, action-packed television, bright lights and noise. Once they feel better, they can attend school on a half-day basis, or attend core classes such as math, reading, science and history and rest in the nurse's office during non-core classes. Attendance for the full day is allowed when the athlete remains asymptomatic the entire day.

What are the risks of returning to play too soon after a concussion?

If an athlete returns too soon after a concussion, or if the brain is stressed physically or mentally before it has time to fully recover, the next concussion may occur with a minimal blow, one that may

not normally cause a concussion. The symptoms of the concussion may be more severe and may last longer than they would if the brain was allowed to fully recover. Also, a rare, but catastrophic event may occur called Second Impact Syndrome, in which the second blow triggers a massive rush of blood into the brain that cannot escape, causing the brain to swell uncontrollably, leading to permanent brain injury and often death.



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