

Concussions In Young Athletes

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What is a concussion?

The simplest definition is that a concussion is a trauma-induced alteration in mental status that may or may not be associated with a loss of consciousness, and that may or may not be long-lasting.

When do concussions occur?

Concussions occur in contact sports, and in any activity that involves rapid acceleration, deceleration, or rotational forces. The athlete suffers either a direct blow to the head or neck from falling and hitting the ground or other surface, colliding with another player, or being struck by an object such as a ball, puck, or bat.

The sports with the highest risk of concussion are football, ice hockey, soccer, wrestling, basketball, field hockey, baseball, softball, volleyball, and cheerleading.

Teens are more prone to concussion than younger children. And, compared with adults, children and teens with concussion generally require more time to recover, and are at greater risk of repeat concussion.

Estimates are that 3 to 5 percent of young athletes suffer a concussion at some time, but the true numbers are probably higher because an athlete may not report an injury or symptoms because (s)he does not want to be prevented from playing. Females tend to have more symptoms, and their concussions often take longer to resolve.

When do symptoms and signs of a concussion appear?

Symptoms and signs may appear immediately, or be delayed for days or weeks. Concussions are highly individual: depending on the person involved, a slight blow can cause serious symptoms, while a harder blow may cause mild symptoms.

It is very important that the symptoms of a concussion are resolved before a student returns to regular school or sports activities. People under age 21 are susceptible to Second Impact Syndrome, which can result in sudden death or severe disability if there is a second concussion within 2 weeks of the first.

What are the possible symptoms and signs of a concussion?

The injured child or teen may have any of the following signs or symptoms, alone or in combination, at the same or different times, immediately or at any time within the first week:

- Confusion
- Reduced thinking speed
- Difficulty with memory
- Nausea and/or vomiting
- Headache
- Fatigue
- Irritability
- Dizziness
- Difficulty with balance

Post-traumatic amnesia may appear as late as 20 minutes after the injury to the brain, and is a more important symptom than loss of consciousness. Resolution of amnesia is indicated by the athlete's ability to recall fully the events that preceded the injury.

What should happen after an athlete suffers a head injury?

Any child or adolescent who loses consciousness for any duration, or exhibits amnesia, should be transported to an emergency department for evaluation. Certainly, any athlete who suffers a seizure, or experiences weakness, numbness or tingling to an extremity must also receive immediate medical attention.

The young athlete who has not lost consciousness after a head injury must still be removed from practice or play for the day. The athlete should not be left unattended on the sideline, and must be re-assessed periodically for new signs or symptoms. Acute symptoms usually resolve within a few minutes, after which the athlete may be allowed to go home, with instructions for a follow-up office visit with his or her physician the following day. No athlete should return to play after a head injury until (s)he is fully asymptomatic and has been cleared by a physician.

What is Max's Law?

The Oregon Legislature passed Max's Law in April 2009 in honor of Max Conratt, a high school quarterback who returned to play before fully recovering from a concussion. He sustained another blow to his head, resulting in a devastating and permanent traumatic brain injury.

Max's Law has three requirements:

1. Coaches of school athletic teams must receive annual training in recognizing concussion symptoms and how to seek proper medical attention for a suspected concussion.
2. An athlete cannot return to play on the same day a concussion is suspected
3. An athlete cannot return to play until all concussion symptoms resolve and a release is signed by a health care professional.

What signs or symptoms on the sideline or at home warrant immediate medical attention? Even in the absence of loss of consciousness or amnesia, the following signs and symptoms warrant medical attention:

- Worsening headache
- Drowsiness or difficulty awakening
- Difficulty recognizing people or places
- Repeated vomiting (vomiting once within the first three hours is okay)
- Increasing confusion
- Increasing irritability
- Unsteady walking
- Slurred speech

What questions should be asked on the field after a head injury?

1. test orientation to person, time and place by asking the athlete his or her name, age, where (s)he is, the time of day, day of week, and month of year
2. test attention by asking the athlete to subtract seven from 100 and keep subtracting. Typically, the athlete should be able to complete a serial seven in 90 seconds with fewer than four errors.
3. Test attention by having the athlete spell a five-letter word, and then spell it backwards
4. Test delayed recall by having the athlete repeat five words that you speak. Ask them to repeat them again five minutes later.
5. Test concentration by having the athlete recite the months of the year in reverse
6. Test recent memory by asking the current score of the game and the name of the opponent. If during a practice, ask questions relating to that day's practice
7. Test distant memory by having the athlete tell you the name of his/her school, and place of birth.

What are some recommendations for the care of the head-injured athlete once home?
If the athlete does not meet requirement for immediate medical attention, parents should follow these recommendations once their child is home:

- Increasing blood flow to the brain may actually slow down recovery from an injury! Activity must be restricted while the concussion resolves; in more extreme cases, the student may need to be put on bed rest.
- Be alert to activities that may cause an increase in symptoms, such as listening to music, light sensitivity, playing computer games, watching TV, or dancing and parties may need to be curtailed. Wearing sunglasses may offer some relief if the student is light sensitive.
- Modify school attendance and non-athletic extracurricular activities if needed, until all symptoms have resolved. The student may need frequent breaks during the school day and during homework completion, or may need to attend school for half-days only for the first few days or week after a head injury.
- Students shouldn't drive while recovering.
- Teachers should reduce workload and homework. Quizzes and tests should be postponed.

What is the expected recovery time after a concussion?

It takes about a week to recover from a concussion, and occasionally longer. The duration of concussion symptoms is more important to a person's outcome than the initial severity of symptoms.

What is post-concussive syndrome?

When signs and symptoms relating to concussion persist for more than one week, sometimes for several months. These include:

- Nausea
- Balance problems or dizziness, or tinnitus (ringing in the ears)
- Persistent headaches
- Fatigue or drowsiness, with increased sleep or, sometimes, insomnia
- Feeling as if "in a fog", or as if "moving in slow motion"
- Cognitive changes (reduced reasoning and problem solving, difficulty following direction, misunderstanding what is said by others, difficulty expressing thoughts verbally, worsened academic performance and concentration at school)
- Social/Behavioral changes (impulsive or inappropriate social behavior, defiance, reduced judgment, decreased insight into self or others, difficulty establishing and maintaining relationships, difficulty following through with responsibilities at home or at work)
- Personality changes (decreased frustration tolerance, easy to anger, anxiety, overreaction to events, or even outright depression and social withdrawal)
- Sensitivity to light and/or noise

When is an imaging test (CT or MRI) needed?

For any athlete who has focal neurologic signs (for instance, weakness, or a seizure in one extremity), severe or worsening headache, loss of consciousness lasting more than a few seconds after the injury, progressively worsening signs or symptoms in the hours and days following the injury, or failure of symptoms to resolve after 2 weeks.

What is a second concussion occurs after the athlete has been cleared to return to play?

The likelihood of long-term and permanent impairment in brain function increases with each concussion. Short intervals of time between concussions increase the severity of impairment. A second moderate or severe (or third mild) concussion in a sport season should end play for that season.