Injury Prevention Series

Concussion

Boston Children's Hospital | Orthopedics & Sports Medicine
bostonchildrens.org/sportsmed
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What is a concussion?

A concussion is a brain injury that occurs when a blow to the head causes the brain to spin in the opposite direction from where the head was struck—what doctors describe as a "rapid, rotational acceleration of the brain." Players with concussions may feel dizzy, have headaches and vision problems, experience nausea or a need to vomit. Concussions vary in severity.

Sport-related concussions are common, but statistics vary on how many occur each year. This is largely because coaches, parents and players are often not trained to recognize the symptoms of a concussion. What's more, some athletes may pretend that they aren't hurt so they can stay in the game.

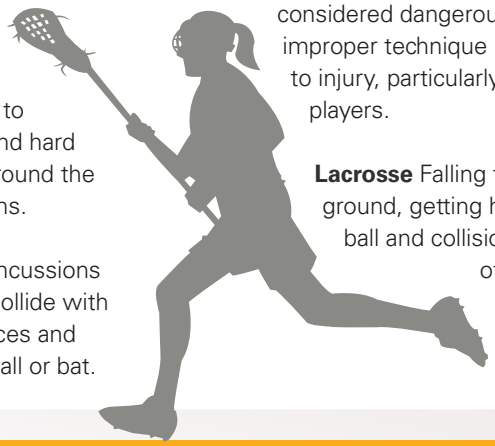
Still, concussions make up about 15 percent of all high school sports injuries and 6 percent of college sports injuries. Of all pediatric patients diagnosed with concussions, between 30 and 50 percent are sustained during athletic practices or competitions.

Player Safety
Who's at risk?

Football The game accounts for the majority of team sport-related concussions—about 250,000 each year. Helmet-to-helmet hits, blows to the head from opponents and hard falls to the turf are a few ways that players can sustain a concussion while playing football.

Ice Hockey Collisions with other players, a stick to the head, falls to the ice and hard contact with the boards around the rink may cause concussions.

Baseball and softball Concussions may result when players collide with other players, run into fences and backstops or are hit by a ball or bat.



Basketball Hitting your head on the floor or being hit in the head by an opponent may cause a concussion.

Soccer Head injuries may be caused by falls and player-to-player contact. "Heading" the ball is not considered dangerous, but improper technique may lead to injury, particularly in young players.

Lacrosse Falling to the ground, getting hit by the ball and collisions with other players may result in head injuries.

Skiing and snowboarding About 20 percent of skiing and snowboarding injuries are head injuries. Hard falls and collisions with trees, signs and other skiers may lead to concussions.

Wrestling, boxing, and martial arts Blows to the head are central to boxing and some martial arts. Hits to the head are not allowed in wrestling, but takedowns may produce head injuries.

Cheerleading Risky stunts, like tossing a participant high in the air, have led to an increase in cheerleading concussions.

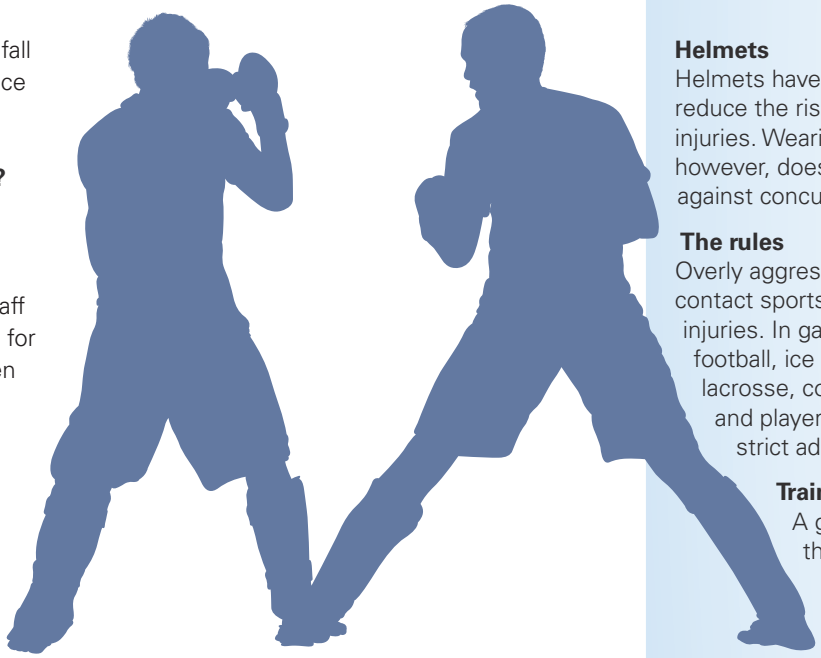
Bicycling When a rider traveling at a high speed falls from a bike, serious head injuries can occur.

Preventing concussions

What you need to know about concussions

What causes a concussion?
A blow to the head, often caused by a fall or a collision with another player or piece of equipment.

How do you know it's a concussion?
Dizziness, headaches and nausea are common concussion symptoms. Still, concussion symptoms aren't always apparent or immediate, so coaches, staff and parents should pay close attention for at least 24 hours after a player has been hit in the head.



Back in the game
Players suspected of sustaining a concussion should be removed from the field and medically evaluated. Players should only be allowed to return to their sport when a medical professional determines that they have completely recovered from their concussions. If a player keeps playing the game with a concussion, risk of brain hemorrhage, swelling and other long-term problems increases.

Repeated concussions
Studies have shown that players who suffer one concussion have a greater chance of sustaining another. The reason for the increased risk is not known, but researchers suggest that some people may be born with a vulnerability for brain injury or that a concussion may cause changes in the brain that increase future risk. Other researchers believe increased risk of concussion is simply a matter of increased playing time or the result of risky and aggressive playing style.

One thing is clear: over time, athletes who have sustained several concussions can experience memory loss and a decline in their ability to think, concentrate and reason.

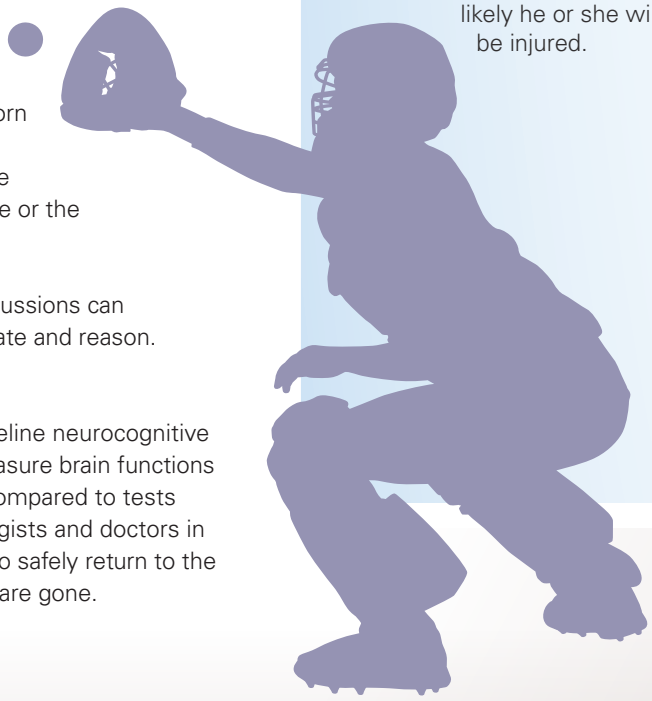
Testing
Many sports leagues and organizations require players to undergo baseline neurocognitive testing before they can take part. Neurocognitive testing is used to measure brain functions like memory, decision-making and reaction times. Baseline tests are compared to tests performed after a concussion to assist athletic trainers, neuropsychologists and doctors in determining when players who have sustained concussions are ready to safely return to the game. No athlete should be allowed to resume play until all symptoms are gone.

Protect Yourself

Helmets
Helmets have been shown to reduce the risk of some head injuries. Wearing a helmet, however, does not fully protect against concussions.

The rules
Overly aggressive and dirty play in contact sports may lead to head injuries. In games such as football, ice hockey, soccer and lacrosse, coaches, staff, parents and players should insist on strict adherence to the rules.

Training
A good way to reduce the risk of concussion is to strengthen the neck and shoulder muscles. Strength training that works these areas can help the body absorb the shock of a blow to the head. Overall fitness is also key: the stronger the athlete, the less likely he or she will be injured.



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This piece is part of an informational series on sports injury prevention produced by the Orthopedic Center/Sports Medicine Division at Boston Children's Hospital. For materials on preventing injuries in other sports, call 617-355-3501 or visit childrenshospital.org/sportsmed.

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