

Fact Sheet SB348

Too many kids are returning to the playing field too soon after a concussion.

41% of concussed athletes returned to play too soon, under guidelines set out by the American Academy of Neurology.

The 11-year-old guidelines say, for example, that if an athlete's concussion symptoms, such as dizziness or nausea, last longer than 15 minutes, he should be benched until he's been symptom-free for a week.

Girls have a higher incidence of concussion than boys

In some sports played by both sexes, girls actually run a higher risk of getting hurt. According to a new study in the Journal of Athletic Training, U.S. female high school soccer athletes suffered almost 40% more concussions than males did (overall, the study estimates that female players suffer some 29,000 concussions annually, compared with 21,000 for boys). In high school basketball, female concussions were nearly 240% higher (overall, girls got 13,000 concussions playing basketball, boys 4,000). In girls' volleyball and boys' basketball and baseball, more than half of concussed players returned to play too soon.

Football is the most dangerous

Boys who play football are still more likely to suffer concussions than any other athletes, 16% of high school football players who lost consciousness during a concussion returned to the field the same day.

The consequences of going back early: September-2008, Jaquan Waller, 16, suffered a concussion during football practice, the school's first responder who examined Waller cleared him to play in a game two days later; during the game he was tackled; moments later, he collapsed on the sidelines and died the next day of second-impact syndrome.

Over-competitive coaches, who are not required to be trained in concussion management, are pushing players back onto the field. And too often the players themselves aren't reporting head trauma, with team spirit giving them too much of a warrior mentality.

Why are girls hurt more than boys

Of course, many girls suck it up too, but there are anatomical reasons that explain why they are more likely to have a concussion diagnosed.

For starters, look to the neck. Bigger, stronger neck muscles can balance the head during impact and lower the chances of the brain's being jolted in a collision. According to a study that will be published in the Journal of Biomechanics, the circumference of men's necks is 20% larger than that of women's necks. Further, resistance tests showed that men's necks are 50% stronger than those of women. Another new biomechanical study shows that during adolescence, boys develop significantly stronger necks than girls do. "More-developed necks allow boys to better absorb a blow to the head," says Dr. Joseph Maroon, a neurosurgeon and consultant to the Sports Concussion Program at the University of Pittsburgh Medical Center.

The way girls play may also make a difference. Kevin Guskiewicz, director of the Sports Medicine Research Laboratory at the University of North Carolina, has found that female athletes are more likely than male athletes to land on the floor or field with their knees locked. The less flexible their knees, the worse their balance. The worse their balance, the more likely they'll hit the ground or another player.

Why is playing sports with concussion symptoms so risky?

During a concussion, arteries constrict, slowing blood flow to the brain. At the same time, calcium floods the energy-producing portions of brain cells. That calcium plays a mean defense, blocking oxygen- and glucose-rich blood from replenishing neurons' energy supply. Brain cells get sluggish, and a concussed athlete who can't focus or suffers from slower reaction times is left more susceptible to a slew of other injuries, including another concussion. A second blow to the head could lead to more arterial constriction and more calcium infusions. "Concussion produces an energy crisis in the brain," says David Hovda, director of the Brain Injury Research Center at UCLA's David Geffen School of Medicine. "A second concussion will cause such an energy demand that it will overwhelm the survival capability of the brain."

That's why caution should be the name of the game. Robert Cantu, a neurosurgeon and concussion expert, insists that even after a mild first-time concussion, athletes must be free of all symptoms for at least a week, both at rest and during exertion, before returning to the field. Cantu's mantra: "When in doubt, sit them out."

Consequences

A TBI may result in mild, moderate or severe changes in one or more areas, including thinking, speech, physical functions and social behavior. The consequences of TBI can be lifelong for some people, while others may be able to recover and resume activities they enjoyed before the injury occurred.

A partial list of **Cognitive Changes** (or **Changes in Thinking**) which can occur due to a brain injury include: Shortened attention span

- Memory problems
- Problem-solving difficulties
- Poor judgment
- Partial or complete loss of reading and writing skills
- Language problems, including communication deficits and loss of vocabulary
- Inability to understand abstract concepts
- Difficulty learning new things

Some of the **Physical Changes** that can occur due to a brain injury include:

- Weakness
- Muscle coordination problems
- Full or partial paralysis
- Changes in sexual functioning
- Changes in the senses (hearing, sight, touch, etc.)
- Seizures (also called traumatic epilepsy)
- Sleep problems
- Speech difficulties

Personality and Behavioral Changes may be subtle or severe and include:

- Difficulty with social skills
- Inability to empathize with others
- Tendency to be more self-centered
- Inability to control one's emotions
- Increases in irritability and frustration
- Inappropriate and/or aggressive behavior
- Extreme mood swings
- Depression (individuals with TBI are considered to be at a high risk for depression)

For further information about how to cope with behavior problems that result from a TBI, see the FCA Fact Sheet "*Coping with Behavior Problems after Head Injury.*"

It is difficult to predict how well someone who has had a brain injury will recover, partly because there is no test a doctor can use to predict recovery. The Glasgow Coma Scale is used to determine the initial severity of a brain injury. It is often used at the scene of the accident or in the emergency room. This scale uses eye movements and ability to speak and move other parts of the body to determine the seriousness of the injury. Ask your doctor to explain the tests used to determine your loved one's ability to recover.

Your loved one's prognosis will depend on many factors, including the severity of the injury, the type of injury, and what parts of the brain have been affected. Prompt diagnosis and treatment will help the recovery process.

Prognosis (or Chance of Recovery)

Recovery Tips for People Who Have Had a TBI

The recovery process is different for everyone. Just as no two people are alike, no two brain injuries are alike. Recovery is typically lengthy—from months to years—because the brain takes a long time to heal. These tips, directed at the person with a brain injury, will help your loved one improve after the injury:

- Get lots of rest.
- Avoid doing anything that could cause another blow or jolt to the head.
- Ask the doctor when it's safe to drive a car, ride a bike, play sports or use heavy equipment, because reaction time may be slower after a brain injury.
- Take prescription medication according to the doctor's instructions.
 - Do not drink alcohol or use street drugs.
 - Write things down to help with memory problems.
 - Ask the doctor to recommend rehabilitation services that might help recovery, and follow those recommendations.