



Concussions In Athletics

What is a Concussion?

A concussion is a trauma-induced alteration in mental status that may or may not involve loss of consciousness. It occurs when the brain is shaken inside the skull upon forceful impact with a stationary or moving object.

Signs and Symptoms of a Concussion?

Signs and symptoms of a concussion include any combination of the following ¹:

- Headache
- Dizziness or vertigo
- Slurred or incoherent speech
- Lack of awareness of surroundings
- Nausea or vomiting
- Light-headedness
- Poor attention and concentration
- Memory dysfunction (before and/or after injury)
- Easy fatigability
- Irritability and low frustration tolerance
- Intolerance of bright lights or difficulty focusing
- Intolerance of loud noises, ringing in the ears
- Any loss of consciousness
- Anxiety and/or depressed mood
- Sleep disturbances
- A vacant stare
- Delayed verbal and motor responses
- Confusion
- Disorientation (walking in the wrong direction, unaware of date, time, or place)
- Gross observable incoordination
- Emotions out of proportion to circumstances

General Rules to Follow When a Concussion is Suspected

- An athlete that shows concussion-like signs and reports symptoms after contact to the head has, at the very least, sustained a mild concussion and should be treated for a concussion ².
- A person with a suspected concussion should be referred to a physician on the day of injury if he/she lost consciousness or experienced amnesia lasting longer than 15 minutes.
- If symptoms begin to worsen, this is a potential emergency and should be treated as such.
- Parents/guardians of someone with a suspected concussion who is under the age of 18 should be contacted.
- Parents/guardian/spouse/roommate/etc. should be informed to watch for any changes that may warrant further medical help
- A person with a suspected concussion should not drive.

Concussion Grading Scale (Academy of Neurology)

A number of concussion grading scales exist. The American Academy of Neurology (March 1997) created the following scale for grading the severity of a concussion ¹.

Grade 1 concussion:

1. Transient confusion
2. No loss of consciousness
3. Concussion symptoms or mental status abnormalities on examination **resolve in less than 15 minutes**

Grade 2 concussion:

1. Transient confusion
2. No loss of consciousness
3. Concussion symptoms or mental status abnormalities on examination **last more than 15 minutes**

Grade 3 concussion:

1. **Any loss of consciousness**, either brief (seconds) or prolonged (minutes)

When Should Someone With a Suspected Condition See a Doctor?

Below is a list of signs and symptoms that warrant an athlete with a suspected condition be seen by a doctor on the:

1) Day-of-Injury ²

- Initial loss of consciousness
- Amnesia lasting longer than 15 minutes
- Deterioration of neurological function *
- Decreasing level of consciousness*
- Decrease of irregularity in pulse*
- Increase in blood pressure
- Unequal, dilated, or unreactive pupils*
- Cranial nerve deficits
- Any signs or symptoms of associated injuries, spine or skull fracture, or bleeding *
- Mental status changes: lethargy, difficulty maintaining arousal, confusion, or agitation *
- Seizure activity *
- Vomiting
- Athlete is still symptomatic at the end of a game (especially at high school level)

* These are signs of a potentially severe condition that requires that the athlete be transported immediately to the nearest emergency department.

2) Day after injury ²

- Any of the findings in the day-of-injury referral category
- Post-concussion symptoms worsen or do not improve over time
- Increase in the number of post-concussion symptoms reported
- Post-concussion symptoms begin to interfere with the athlete's daily activities (sleep disturbances or cognitive difficulties)

Instructions to Follow After Sustaining a Concussion:

- Take acetaminophen as directed (Tylenol) for headaches
- Avoid Ibuprofen for headaches
- Use ice packs on head and neck as needed for comfort
- Eat a light diet (avoid spicy foods)
- Rest (no strenuous activity or sports)
- Do not drink alcohol

Return to Play Protocol: ¹

It is important not to return to play too soon after sustaining a concussion. In very general terms, an athlete must be totally symptom free before returning to play. Every concussion is different. The signs of symptoms of a concussion may resolve within minutes or it could take multiple days. It is important for the athlete to be truthful in disclosing any lingering subjective symptoms such as lingering headaches to parents, coaches, medical staff, etc. Returning to play too soon following a concussion can put an individual at risk for conditions that are more serious (these are outlined on the following page). Below is return to play criteria after sustaining a first time concussion. Keep in mind that if an athlete has had a previous concussion the return to play time frame made by a medical professional should be more guarded.

Grade 1 Concussion:

1. The athlete should be removed from the contest
2. The athlete should be examined immediately and at 5 minute intervals for the development of mental status abnormalities or post-concussive symptoms at rest and with exertion.
3. The athlete may return to contest if mental status abnormalities or post-concussive symptoms clear within 15 minutes.
4. A second Grade 1 concussion in the same contest eliminates the athlete from competition that day, with the athlete returning only if asymptomatic for one week at rest and with exercise.

Grade 2 Concussion:

1. The athlete should be removed from contest and disallowed to return that day.
2. The athlete should be examined on-site frequently for signs of evolving intracranial pathology.
3. A trained person should reexamine the athlete the following day.
4. A physician should perform a neurologic examination to clear the athlete for return to play after 1 full asymptomatic week at rest and with exertion.
5. CT or MRI scanning is recommended in all instances where headache or other associated symptoms worsen or persist longer than one week.
6. Following a second Grade 2 concussion, return to play should be deferred until the athlete has had at least two weeks symptom-free at rest and with exertion.
7. Terminating the season for that athlete is mandated by any abnormality on CT or MRI scan consistent with brain swelling, contusion, or other intracranial pathology.

Grade 3 Concussion:

1. If the athlete remains unconscious or symptoms worsen, activate EMS.
2. The athlete should be withheld from play until asymptomatic for a minimum of 1 week at rest and with exertion at which time a doctor should clear him/her for participation

Possible Consequences to Returning to Play Too Early Include:³

Second-impact syndrome – This condition, although very rare, occurs in athletes who return to competition before the symptoms of a first concussion have completely resolved. A second blow to the head, even a minor one, can result in a loss of autoregulation of the brain's blood supply; this leads to a vascular engorgement and subsequent herniation of the brain that is usually fatal.

Post-concussion syndrome - Returning to competition prematurely may increase the likelihood that an athlete will develop post-concussion syndrome. This syndrome is characterized by fatigue, headaches, equilibrium disturbances or difficulty in concentrating that may persist for weeks to months after the initial injury.

For More Information on Concussions It Is Strongly Recommended That Parents, Coaches, and Athletes Visit:

The National Athletic Trainers' Association's Concussion Position Statement:

<http://www.nata.org/statements/position/concussion.pdf>

CDC National Center For Injury Prevention and Control "Heads Up" Information

http://www.cdc.gov/ncipc/tbi/Coaches_Tool_Kit.htm

¹ Practice Parameter: The Management of Concussion in Sports. Quality Standards Subcommittee of the American Academy of Neurology. American Academy of Neurology.

² Guskiewicz, K.M., et al. (2004). National Athletic Trainers' Association Position Statement: Management of Sport-Related Concussion. The Journal of Athletic Training, 39(3): 280-297.

³ Harmon, K.G. (1999). Assessment and Management of Concussions in Sports. American Family Physician. 60(3).