



New York State Athletic Trainers' Association

Concussion Education Statement

The New York State Athletic Trainers' Association (NYSATA) is committed to the prevention, assessment, evaluation, and management of concussions. NYSATA, a leading resource in concussion education for health care professionals, athletes, coaches and parents, has forged a relationship with Sport Safety International; a medical consulting firm that specializes in providing expert advice in the area of sport safety and injury prevention, to help introduce "Concussion Wise™" an online concussion education program designed for athletic trainers, coaches, parents, athletes and other health care professionals. The program is available on the NYSATA website, <http://gonysata2.org/>, or directly online at <http://concussionwise.com/NY>.

This document is not intended as a standard of care, and should not be interpreted as such. Individual treatment will depend on the facts and circumstances specific to each individual case. This document will be formally reviewed and updated by the NYSATA accordingly as new research is provided.

Definition of Concussion:

Concussion is defined as a complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces. Several common features that define the nature of a concussive head injury include:

1. Concussion may be caused either by a direct blow to the head, face or neck or a blow elsewhere on the body with an "impulsive" force transmitted to the head.
2. Concussion typically results in the rapid onset of short-lived impairment of neurologic function that resolves spontaneously.
3. Concussion may result in neuropathological changes but the acute clinical symptoms largely reflect a functional disturbance rather than a structural injury.
4. Concussion results in a graded set of clinical symptoms that may or may not involve loss of consciousness. Resolution of the clinical and cognitive symptoms typically follows a sequential course. In a small percentage of cases, however, post-concussive symptoms may be prolonged.
5. No abnormality on standard structural neuroimaging studies is seen in concussion (1).

*If the athlete has a certified athletic trainer who covers the particular school and/or team, the certified athletic trainer should be consulted regarding the athlete's injury and care. The certified athletic trainer and/or team physician can be a valuable resource regarding the mechanism of injury, immediate signs and symptoms, and previous care rendered. The certified athletic trainer may be familiar with the athlete's personality and other habits that will help in the evaluation of any post-concussive symptoms.

Prevention of Concussion and Protective Equipment:

There is no clinical evidence that currently available protective equipment will prevent concussion. In certain sports, protective equipment may prevent other forms of head injury which may be specific for those sports. Consideration of rule changes (i.e., no head checking in ice hockey) to reduce the head injury rate may be appropriate where a clear-cut mechanism is implicated in a particular sport. Similarly, rule enforcement is a critical aspect of such approaches and officials and coaches play an important role.

An important consideration in the use of protective equipment is the concept of risk compensation. This is where the use of protective equipment results in behavioral change such as the adoption of more dangerous playing techniques, which can result in a paradoxical increase in injury rates. This may be a particular concern in child and adolescent athletes where head injury rates are often higher than in adult athletes (2).

Signs and Symptoms of Concussion may include:*

- Amnesia
- Depression
- Dizziness
- Double or “fuzzy” vision
- Drowsiness
- Feeling of being “in a fog”
- Headache
- Irritability
- Lethargy
- Loss of consciousness
- Nausea or vomiting
- Poor concentration; memory problems
- Poor balance or coordination
- Ringing in ears
- Sensitivity to light or noise
- Sleep disturbances
- Withdrawal from others

*This is a list of some of the many signs and symptoms of concussion. Signs and symptoms may vary between each specific case.

Second Impact Syndrome:

Second impact syndrome is a very rare condition in which a second concussion occurs before a first concussion has properly healed, causing rapid and severe brain swelling and often catastrophic results. Second impact syndrome can result from even a very mild concussion that occurs days or weeks after the initial concussion. In many cases, second impact syndrome is fatal. In those cases where it isn't fatal, you can expect the long-term effects to be similar to those of severe traumatic brain injury (3).

Post-Concussive Syndrome:

Post-concussive syndrome is a term that describes the physical, cognitive, and emotional symptoms that are caused by concussion and which can last for a varying amount of time after injury. Some symptoms show up right away, but others may not appear or be noticed until the next day or even later. Some symptoms might resolve fairly quickly, but others can persist much longer.

When a player shows ANY symptoms or signs of a concussion:

The responsibility for observing signs, symptoms, and behaviors that are consistent with a concussion is shared by both sport officials and school officials. The following protocol should be followed if any signs, symptoms, or behaviors consistent with a concussion are observed:

Sport Official: Remove the athlete from the contest. The official is NOT responsible for the sideline assessment or the management of the athlete once they have been removed from the game.

School Official: The athlete needs to be assessed by an appropriate health care professional. School health personnel include the chief school medical officer, certified athletic trainer, physician, school nurse, or an EMT that is a member of the on-site EMS squad.

If the appropriate health care professional suspects a concussion, the student athlete MAY NOT return to the contest. The athlete MAY NOT return to the contest if an appropriate health care professional is not available.

A student diagnosed with a concussion must be cleared by the chief medical school officer prior to returning to participation (4).

Guidelines for Return to Play Following Sports Concussion

Athletes who have sustained a concussive episode should have mental as well as physical rest. Suggestions for school modification include:

- Out of school if symptomatic, then gradual re-entry into school **as tolerable**
- Rest breaks during school in quiet locations; avoiding over-stimulation

Recommended Return to Play Protocol

Returning to play following a concussion should follow a step-wise process under the medical supervision of a healthcare provider (certified athletic trainer, physician, nurse practitioner, physician assistant):

Day 1: No exertional activity until asymptomatic for 24 hours

Day 2: Begin low impact activity such as walking, stationary bicycle, etc.; no resistance training

Day 3: Initiate aerobic activity fundamental to specific sport

Day 4: Begin non-contact skill drills specific to sport

Day 5: Full contact in practice setting

Athletes should continue to the next level only if asymptomatic at the current level. If any post-concussive symptoms occur, the athlete should drop back to the previous asymptomatic level and try to progress after being asymptomatic for 24 hours. Once the athlete is asymptomatic and has completed the stepwise process, then the concussed athlete will need a follow-up evaluation by a licensed health care professional (who is trained in the recognition and management of concussions) prior to returning to full participation.

When in doubt – Sit ‘em out

Sport-related concussion is a growing concern among healthcare providers. As the number of people participating in sports activities continues to increase, healthcare providers must be able to recognize, evaluate, and treat this unique injury. Additionally, healthcare providers need to be sensitive to the subtle and minor symptoms of concussion.

As sport-related concussions become more widely recognized and managed in a more uniform manner, potentially disastrous short- and long-term effects may ultimately be avoided.

References:

1. McCrory P, Meeuwisse W, Johnston K, Dvorak J, Aubry M, Molloy M, Cantu R. (2009). “*Consensus statement on concussion in sport – The 3rd International Conference on concussion in sport, held in Zurich, November 2008*”. *Journal of Clinical Neuroscience* 16: 755-763.
2. McCrory P, Johnston K, Meeuwisse W, Aubry M, Cantu R, Dvorak J, Graf-Baumann T, Kelly J, Lovell, M, Schamasch, P. (2005). “*Summary and Agreement Statement of the 2nd International Conference on Concussion in Sport, Prague 2004.*” *Clin J Sport Med* 15 (2) 48-55.
3. Cantu RC (1998). “*Second-impact syndrome.*” *Clinics in Sports Medicine* 17 (1): 37–44.
4. New York State Public High School Athletic Association Memo (August 19, 2010).