



SUGGESTED GUIDELINES FOR MANAGEMENT OF CONCUSSION IN SPORTS

National Federation of State High School Associations (NFHS)
Sports Medicine Advisory Committee (SMAC)

Introduction

A concussion is type of traumatic brain injury that interferes with normal function of the brain. It occurs when the brain is rocked back and forth or twisted inside the skull as a result of a blow to the head or body. What may appear to be only a mild jolt or blow to the head or body can result in a concussion.

The understanding of sports-related concussion has evolved dramatically in recent years. We now know that young athletes are particularly vulnerable to the effects of a concussion. Once considered little more than a “ding” on the head, it is now understood that a concussion has the potential to result in short or long-term changes in brain function, or in some cases, death.

What is a concussion?

You've probably heard the terms “ding” and “bell-ringer.” These terms were once used to refer to minor head injuries and thought to be a normal part of sports. There is no such thing as a minor brain injury. Any suspected concussion must be taken seriously. A concussion is caused by a bump, blow, or jolt to the head or body. Basically, any force that is transmitted to the head causes the brain to literally bounce around or twist within the skull, potentially resulting in a concussion.

It used to be believed that a player had to lose consciousness or be “knocked-out” to have a concussion. This is not true, as the vast majority of concussions do not involve a loss of consciousness. In fact, less than 10% of players actually lose consciousness with a concussion.

What exactly happens to the brain during a concussion is not entirely understood. It appears to be a very complex injury affecting both the structure and function of the brain. The sudden movement of the brain causes stretching and tearing of brain cells, damaging the cells and creating chemical changes in the brain. Once this injury occurs, the brain is vulnerable to further injury and very sensitive to any increased stress until it fully recovers.

Common sports injuries such as torn ligaments and broken bones are structural injuries that can be seen on MRIs or x-rays, or detected during an examination. A concussion, however, is primarily an injury that interferes with how the brain works. While there is damage to brain cells, the damage is at a microscopic level and cannot be seen on MRI or CT scans. Therefore, the brain looks normal on these tests, even though it has been seriously injured.

Recognition and Management

If an athlete exhibits any signs, symptoms, or behaviors that make you suspicious that he or she may have had a concussion, that athlete must be removed from all physical activity, including sports and recreation. Continuing to participate in physical activity after a concussion can lead to worsening concussion symptoms, increased risk for further injury, and even death.

SYMPTOMS REPORTED BY ATHLETE
Headache
Nausea
Balance problems or dizziness
Double or fuzzy vision
Sensitivity to light or noise
Feeling sluggish
Feeling foggy or groggy
Concentration or memory problems
Confusion

Parents and coaches are not expected to be able to “diagnose” a concussion. That is the role of an appropriate health-care professional. However, you must be aware of the signs, symptoms and behaviors of a possible concussion, and if you suspect that an athlete may have a concussion, then he or she must be immediately removed from all physical activity.

SIGNS OBSERVED BY PARENTS, FRIENDS, TEACHERS OR COACHES
Appears dazed or stunned
Is confused about what to do
Forgets plays
Is unsure of game, score, or opponent
Moves clumsily
Answers questions slowly
Loses consciousness
Shows behavior or personality changes
Can't recall events prior to hit
Can't recall events after hit

When in doubt, sit them out!

When you suspect that a player has a concussion, follow the "Heads Up" 4-step Action Plan.

1. Remove the athlete from play.
2. Ensure that the athlete is evaluated by an appropriate health-care professional.
3. Inform the athlete's parents or guardians about the possible concussion and give them information on concussion.
4. Keep the athlete out of play the day of the injury and until an appropriate health-care professional says he or she is symptom-free and gives the okay to return to activity.

The signs, symptoms, and behaviors of a concussion are not always apparent immediately after a bump, blow, or jolt to the head or body and may develop over a few hours. An athlete should be observed following a suspected concussion and should never be left alone.

Athletes must know that they should never try to "tough out" a suspected concussion. Teammates, parents and coaches should never encourage an athlete to "play through" the symptoms of a concussion. In addition, there should never be an attribution of bravery to athletes who do play despite having concussion signs or symptoms. The risks of such behavior must be emphasized to all members of the team, as well as coaches and parents.

If an athlete returns to activity before being fully healed from an initial concussion, the athlete is at risk for a repeat concussion. A repeat concussion that occurs before the brain has a chance to recover from the first can slow recovery or increase the chance for long-term problems. In rare cases, a repeat concussion can result in severe swelling and bleeding in the brain that can be fatal.

Cognitive Rest

A concussion can interfere with school, work, sleep and social interactions. Many athletes who have a concussion will have difficulty in school with short- and long-term memory, concentration and organization. These problems typically last no longer than a week or two, but for some these difficulties may last for months. It is best to lessen the student's class load early on after the injury. Most students with concussion recover fully. However, returning to sports and other regular activities too quickly can prolong the recovery.

The first step in recovering from a concussion is rest. Rest is essential to help the brain heal. Students with a concussion need rest from physical and mental activities that require concentration and attention as these activities may worsen symptoms and delay recovery. Exposure to loud noises, bright lights, computers, video games, television and phones (including texting) all may worsen the symptoms of concussion. As the symptoms lessen, increased use of computers, phone, video games, etc., may be allowed.

Return to Play

After suffering a concussion, **no athlete should return to play or practice on that same day.** Previously, athletes were allowed to return to play if their symptoms resolved within 15 minutes of the injury. Newer studies have shown us that the young brain does not recover quickly enough for an athlete to return to activity in such a short time.

An athlete should never be allowed to resume physical activity following a concussion until he or she is symptom free and given the approval to resume physical activity by an appropriate health-care professional.

Once an athlete no longer has signs, symptoms, or behaviors of a concussion **and is cleared to return to activity by a health-care professional**, he or she should proceed in a step-wise fashion to allow the brain to re-adjust to exercise. In most cases, the athlete will progress one step each day. The return to activity program schedule **may** proceed as below **following medical clearance**:

Progressive Physical Activity Program

- Step 1:** Light aerobic exercise- 5 to 10 minutes on an exercise bike or light jog; no weight lifting, resistance training, or any other exercises.
- Step 2:** Moderate aerobic exercise- 15 to 20 minutes of running at moderate intensity in the gym or on the field without a helmet or other equipment.
- Step 3:** Non-contact training drills in full uniform. May begin weight lifting, resistance training, and other exercises.
- Step 4:** Full contact practice or training.
- Step 5:** Full game play.

If symptoms of a concussion re-occur, or if concussion signs and/or behaviors are observed at any time during the return to activity program, the athlete must discontinue all activity and be re-evaluated by their health care provider.

Concussion in the Classroom

Following a concussion, many athletes will have difficulty in school. These problems may last from days to months and often involve difficulties with short- and long-term memory, concentration, and organization. In many cases, it is best to lessen the student's class load early on after the injury. This may include staying home from school for a few days, followed by a lightened schedule for a few days, or longer, if necessary. Decreasing the stress on the brain early on after a concussion may lessen symptoms and shorten the recovery time.

What to do in an Emergency

Although rare, there are some situations where you will need to call 911 and activate the Emergency Medical System (EMS). The following circumstances are medical emergencies:

1. Any time an athlete has a loss of consciousness of any duration. While loss of consciousness is not required for a concussion to occur, it may indicate more serious brain injury.
2. If an athlete exhibits any of the following: decreasing level of consciousness, looks very drowsy or cannot be awakened, if there is difficulty getting his or her attention, irregularity in breathing, severe or worsening headaches, persistent vomiting, or any seizures.

Suggested Concussion Management

1. No athlete should return to play (RTP) or practice on the same day of a concussion.
2. Any athlete suspected of having a concussion should be evaluated by an appropriate health-care professional that day.
3. Any athlete with a concussion should be medically cleared by an appropriate health-care professional prior to resuming participation in any practice or competition.
4. After medical clearance, RTP should follow a step-wise protocol with provisions for delayed RTP based upon return of any signs or symptoms.

References

Guskiewicz KM, et al. National Athletic Trainers' Association position statement: management of sport-related concussion. Journal of Athletic Training 2004; 39:280-297.

McCrory P, et al. Consensus statement on concussion in sport: the 3rd International Conference on Concussion in Sport held in Zurich, November 2008. Journal of Athletic Training 2009; 44:434-48.

Additional Resources

Heads Up: Concussion in High School Sports

http://www.cdc.gov/concussion/headsup/high_school.html

Concussion in Sports- What you need to know.

<http://www.nfhslearn.com/electiveDetail.aspx?courseID=15000>

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University Interscholastic League
Implementation Information for
Chapter 38, Sub Chapter D of the Texas Education Code

When In Doubt, Sit Them Out!

Introduction

Concussions received by participants in sports activities are an ongoing concern at all levels. Recent interest and research in this area has prompted reevaluations of treatment and management recommendations from the high school to the professional level. Numerous state agencies throughout the U.S. responsible for developing guidelines addressing the management of concussion in high school student-athletes have developed or revised their guidelines for concussion management. The present document will provide information on compliance with Chapter 38, Sub Chapter D of the Texas Education Code (TEC).

Definition of Concussion

There are numerous definitions of concussion available in medical literature as well as in the previously noted "guidelines" developed by the various state organizations. The feature universally expressed across definitions is that concussion 1) is the result of a physical, traumatic force to the head and 2) that force is sufficient to produce altered brain function which may last for a variable duration of time. For the purpose of this program the definition presented in Chapter 38, Sub Chapter D of the Texas Education Code is considered appropriate:

"Concussion" means a complex pathophysiological process affecting the brain caused by a traumatic physical force or impact to the head or body, which may:

- (A) include temporary or prolonged altered brain function resulting in physical, cognitive, or emotional symptoms or altered sleep patterns; and
- (B) involve loss of consciousness.

Concussion Oversight Team (COT):

According to TEC Section 38.153:

'The governing body of each school district and open-enrollment charter school with students enrolled who participate in an interscholastic athletic activity shall appoint or approve a concussion oversight team.

Each concussion oversight team shall establish a return-to-play protocol, based on peer-reviewed scientific evidence, for a student's return to interscholastic athletics practice or competition following the force or impact believed to have caused a concussion.'

According to TEC Section 38.154:

'Sec. 38.154. CONCUSSION OVERSIGHT TEAM: MEMBERSHIP.

(a) Each concussion oversight team must include at least one physician and, to the greatest extent practicable, considering factors including the population of the



metropolitan statistical area in which the school district or open-enrollment charter school is located, district or charter school student enrollment, and the availability of and access to licensed health care professionals in the district or charter school area, must also include one or more of the following:

- (1) an athletic trainer;
- (2) an advanced practice nurse;
- (3) a neuropsychologist; or
- (4) a physician assistant.

(b) If a school district or open-enrollment charter school employs an athletic trainer, the athletic trainer must be a member of the district or charter school concussion oversight team.

(c) Each member of the concussion oversight team must have had training in the evaluation, treatment, and oversight of concussions at the time of appointment or approval as a member of the team.'

Responsible Individuals:

At every activity under the jurisdiction of the UIL in which the activity involved carries a potential risk for concussion, there should be a designated individual who is responsible for identifying student-athletes with symptoms of concussion injuries. That individual should be a physician or an advanced practice nurse, athletic trainer, neuropsychologist, or physician assistant, as defined in TEC section 38.151, with appropriate training in the recognition and management of concussion in athletes. In the event that such an individual is not available, a supervising adult approved by the school district with appropriate training in the recognition of the signs and symptoms of a concussion in athletes could serve in that capacity. When a licensed athletic trainer is available such an individual would be the appropriate designated person to assume this role. The individual responsible for determining the presence of the symptoms of a concussion is also responsible for creating the appropriate documentation related to the injury event.

Manifestation/Symptoms

Concussion can produce a wide variety of symptoms that should be familiar to those having responsibility for the well being of student-athletes engaged in competitive sports in Texas. Symptoms reported by athletes may include: headache; nausea; balance problems or dizziness; double or fuzzy vision; sensitivity to light or noise; feeling sluggish; feeling foggy or groggy; concentration or memory problems; confusion.

Signs observed by parents, friends, teachers or coaches may include: appears dazed or stunned; is confused about what to do; forgets plays; is unsure of game, score or opponent; moves clumsily; answers questions slowly; loses consciousness; shows behavior or personality changes; can't recall events prior to hit; can't recall events after hit.

Any one or group of symptoms may appear immediately and be temporary, or delayed and long lasting. The appearance of any one of these symptoms should alert the responsible personnel to the possibility of concussion.



Response to Suspected Concussion

According to TEC section 38.156, a student 'shall be removed from an interscholastic athletics practice or competition immediately if one of the following persons believes the student might have sustained a concussion during the practice or competition:

- (1) a coach;
- (2) a physician;
- (3) a licensed health care professional; or
- (4) the student's parent or guardian or another person with legal authority to make medical decisions for the student.'

Return to Activity/Play Following concussion

According to TEC section 38.157:

'A student removed from an interscholastic athletics practice or competition under TEC Section 38.156 (believed that they might have sustained a concussion) may not be permitted to practice or compete again following the force or impact believed to have caused the concussion until:

- (1) the student has been evaluated; using established medical protocols based on peer-reviewed scientific evidence, by a treating physician chosen by the student or the student's parent or guardian or another person with legal authority to make medical decisions for the student;
- (2) the student has successfully completed each requirement of the return-to-play protocol established under TEC Section 38.153 necessary for the student to return to play;
- (3) the treating physician has provided a written statement indicating that, in the physician's professional judgment, it is safe for the student to return to play; and
- (4) the student and the student's parent or guardian or another person with legal authority to make medical decisions for the student:
 - (A) have acknowledged that the student has completed the requirements of the return-to-play protocol necessary for the student to return to play;
 - (B) have provided the treating physician's written statement under Subdivision (3) to the person responsible for compliance with the return-to-play protocol under Subsection (c) and the person who has supervisory responsibilities under Subsection (c); and
 - (C) have signed a consent form indicating that the person signing:
 - (i) has been informed concerning and consents to the student participating in returning to play in accordance with the return-to-play protocol;
 - (ii) understands the risks associated with the student returning to play and will comply with any ongoing requirements in the return-to-play protocol;
 - (iii) consents to the disclosure to appropriate persons, consistent with the Health Insurance Portability and Accountability Act of 1996 (Pub. L.



No. 104-191), of the treating physician's written statement under Subdivision (3) and, if any, the return-to-play recommendations of the treating physician; and
(iv) understands the immunity provisions under TEC Section 38.159.'

Guidelines For Safely Resuming Participation Following a Concussion

TEC section 38.155 requires the UIL to provide guidelines for safely resuming participation in an athletic activity following a concussion. TEC 38.153 indicates that: 'Each concussion oversight team shall establish a return-to-play protocol, based on peer-reviewed scientific evidence, for a student's return to interscholastic athletics practice or competition following the force or impact believed to have caused a concussion.'

A student athlete, if it is believed that they might have sustained a concussion, shall not return to practice or competition until the student athlete has been evaluated and cleared in writing by his or her treating physician and all other notice and consent requirements have been met. From that point, the student athlete must satisfactorily complete the protocol established by the school district's or charter school's Concussion Oversight Team.

The current 'peer reviewed scientific evidence' suggests that, after complying with the clearance, notice and consent requirements noted above, a 'step-by-step' return to play protocol that includes a progressive exercise component is indicated for high school participants.

Reducing/Preventing Head and Neck Injuries in Football

1. Complete preseason physical exams and medical histories for all participants in accordance with established rules. Identify during the physical exam those athletes with a history of previous head or neck injuries. If the physician has any questions about the athlete's readiness to participate, the athlete should not be allowed to play.
2. A physician should be present at all games. If it is not possible for a physician to be present at all games and practice sessions, emergency measures must be provided. The total staff should be organized in that each person will know what to do in case of head or neck injury in a game or practice. Have a plan ready and have your staff prepared to implement that plan. Prevention of further injury is the main objective.
3. Coaches should drill the athletes in the proper execution of the fundamentals of football skills, particularly blocking and tackling. **Keep the head out of football.**
4. Coaches and officials should discourage the players from using their heads as battering rams. The rules prohibiting spearing and helmet-to-helmet contact should be enforced in practice and in games. The players should be taught to



respect the helmet as a protective device and that the helmet should not be used as a weapon.

5. All coaches, physicians, and trainers should take special care to see that each player's equipment is properly fitted, particularly the helmet.
6. Strict enforcement of the rules of the game by both coaches and officials may help reduce serious injuries.
7. When a player has experienced or shown signs of head trauma (loss of consciousness, visual disturbances, headache, inability to walk correctly, obvious disorientation, memory loss) they should receive immediate medical attention and should not be allowed to return to practice or game without permission from the proper medical authorities.

For additional information, consult the 'Frequently Asked Questions And Resources Document Regarding Implementation of House Bill 2038' that is available on Health and Safety Section of the UIL web site.