



Duchesne Academy
Athletic Department
Concussion Management Protocol

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Introduction and Overview

Concussion or Mild Traumatic Brain Injury (MTBI)

A concussion is a type of mild traumatic brain injury that interferes with normal function of the brain. A concussion is caused by a bump, blow, or jolt to the head or body causing a metabolic disturbance of brain functioning. Any force that is transmitted to the head causes the brain to literally move or twist within the skull, potentially resulting in a concussion. It is a multisystem injury that affects the brain, cervical spine, vestibular, ocular motor, and autonomic nervous systems. It can cause blood flow changes, biochemical changes, structural changes, inflammation, neuronal injury, endocrine changes and an emotional disturbance.

A concussion is primarily an injury that interferes with how the brain works. 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 and blood flow changes in the brain. While there can be damage to brain cells, the damage is at a microscopic level and cannot be seen on standard brain MRI or CT scans.

What may appear to be only a mild jolt or blow to the head or body can result in 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. Any suspected concussion should be taken seriously and be evaluated and treated.

This injury causes brain function to change which results in an altered mental state (either temporary or prolonged). Physiologic and/or anatomic disruptions of connections between some nerve cells in the brain occur. Loss of consciousness only occurs in 5-10% with concussion; thus, it is enough to cause, but not necessary to have, a concussion.

Concussions can have serious and long-term health effects. Signs and symptoms include, but are not limited to:

Observable signs

- Appears dazed or stunned
- Confused about assignment or position
- Forgets instruction
- Unsure of game, score or opponent
- Moves clumsily
- Answers questions slowly
- Loses consciousness (even briefly)
- Shows mood, behavior and personality changes
- Can't recall events prior to or after hit or fall
- Loses balance or is unsteady when walking

Symptoms reported by athlete

- Headache or "pressure" in head
- Nausea or vomiting
- Balance problems or dizziness
- Double or blurry vision
- Sensitivity to light or noise
- Feeling sluggish, hazy, foggy or groggy
- Concentration or memory problems
- Confusion
- Just not "feeling right" or is "feeling down"
- More fatigued than usual
- Change in sleeping pattern

Once this injury occurs, the brain is vulnerable to further injury and very sensitive to any increased stress until it fully recovers.

Second Impact Syndrome (SIS)

Second impact syndrome (SIS) refers to catastrophic brain events which may occur when a second concussion occurs while the athlete is still symptomatic and healing from a previous concussion. The second injury may occur within days or weeks following the first injury. Loss of consciousness is not required. The second impact causes brain swelling leading to other widespread damage to the brain. SIS is very rare but can be fatal. Most often SIS occurs when an athlete returns to activity without being symptom free from the previous concussion. This is why recognition of a concussion is imperative.

Recognition of Concussion in the Athlete

Most athletes are at a higher risk of suffering a concussion. The rate of concussion varies between sports with the highest rate being about 20% in collision sports such as in football or rugby. Many concussions can go undiagnosed and unreported, so it is difficult to estimate the rate of concussion in any sport. Symptoms are not always clear-cut or the same and knowing when it is safe for an athlete to return to sport is not always clear.

Post-concussion symptoms can be quite subtle and may go unnoticed by the athlete, team medical staff, or coaches. Thus professionals familiar with concussions are needed to assess for or notice a potential concussion. Players may be reluctant to report concussive symptoms for fear that they will be removed from the game, and this may jeopardize their status on the team, or their athletic careers.

A student-athlete shall be removed from practice or competition immediately if one of the following suspects that the student-athlete might have sustained a concussion:

- Athlete's Coach
- Parent/Guardian
- Licensed Health Care Professional

Initial Evaluation of Suspected Concussion:

The student-athlete will be immediately removed from practice or competition if he/she is exhibiting any signs or symptoms of the concussion. At this point, a formal clinical evaluation by a trained healthcare professional will be performed to determine the presence of a more serious injury such as C-spine injury, neurological deficits, skull fracture, intracranial bleeding, and catastrophic injury.^{1,4,5} The immediate sideline evaluation should be based on injury recognition signs (e.g., gross motor instability, confusion, LOC), assessment of symptoms, cognitive and cranial nerve function, and balance. Recognizing a suspected concussion is best approached through the utilization of multidimensional testing.^{1,3,4} Somatic, cognitive, gait, neurologic, and affective function will be evaluated via the SCAT-6 (**see form under evaluation tools – section 3**);

▪ **Sport Concussion Assessment Tool 2023 (SCAT6) – Healthcare Professional**

The SCAT6 Immediate Assessment/Neuro Screen will be administered to the student-athlete at the time of a suspected concussion. Follow-up testing, and evaluation of the student-athlete using the SCAT6 Off-Field Assessment will take place later in the event (example, half time or post-game) or prior to the student-athlete's departure (if circumstances allow) from the venue or practice. The age of the student athlete determines which version of the SCAT is used:

***The SCAT6 is used for evaluating athletes aged 13 years and older. For children ages 8-12 please use the Child SCAT6.**

▪ **Concussion Recognition Tool (CRT) – Coaches (if no athletic trainer or physician available)**

The CRT was designed for non-professional healthcare personnel (e.g., coaches or volunteers) to help them spot a possible concussion. It does not necessarily diagnose a concussion which is left the healthcare professionals experienced in this, but rather giving the non-healthcare provider a tool used to remove a student-athlete from practice or play because of a potential concussion. When in doubt sit them out.

Evaluation and Management for Concussion

1. The student-athlete does not return to a game or practice if he/she is suspected to have, or has any signs or symptoms of a concussion.
2. Observe the student-athlete for status changes every 20-30 minutes for the first 90 minutes after the injury. Do not allow the athlete to be alone after the concussion.
3. Parent/Guardian is notified of injury & athlete is referred to a physician of their choice.
4. Provide post-concussion home instructions to parent or legal guardian.

5. Do not allow athlete to drive home the day of concussion.
6. Doctor recommended school modifications.
 - a. Athletic staff will notify school administrators/teachers that the student-athlete has a concussion.
 - b. Student-athlete may need special accommodations such as limited computer work, reading activities, testing, assistance to class, etc. until symptoms subside.
 - c. Student-athlete may need to miss a few days of school acutely after the concussion, only be able to attend school for half days, or may need daily rest periods until symptoms subside with physician authorization.
7. Follow-up assessment should occur 72 hours or more using the Sport Concussion Office Assessment Tool (SCOAT6). The SCOAT6 is a multidimensional clinical screening, evaluation, and management tool. It should be used in a controlled office environment by Health Care Professionals (HCP) following a sport-related concussion. The SCOAT6 may be used for initial evaluation or for follow-up evaluation as athlete's symptoms are subsiding.

****The SCOAT6 is used for evaluating athletes aged 13 years and older. For children ages 8-12, please use the Child SCOAT6.***

Recovery for the Athlete

The first step in recovering from a concussion is rest. Rest is essential to help the brain heal. Student-athletes 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. Rest is defined to symptom limited activity at home; not lying in a dark room with no stimulation. Too much rest is found to prolong concussion recovery. As the symptoms lessen, usually within 48-72 hours, symptom-limiting gradual increases in physical and cognitive activity is encouraged if symptoms do not increase. The idea of sub-symptomatic activity with a gradual increase is known to speed up recovery compared to no activity until asymptomatic.

Light aerobic exercise after a concussion is beneficial and helps with recovery. Light aerobic exercise helps improve blood flow to the brain and improves autonomic function. Per the 2023 Concussion Consensus Statement, athletes may begin the Return to Sport Protocol Step 1, on day 3 post-concussion. If the school/school district employs an athletic trainer (this includes an outreach athletic trainer) The Buffalo Concussion Protocol can also be used 3 days post-concussion depending on severity of symptoms and athletic trainer's clinical judgement as a metric for exercise as treatment and recovery. If a treadmill or stationary bike is not available for use please use Buffalo Exercise Treatment – Light Exercise Form (see form under evaluation tools – section 3).

Concussion Management of the Athlete

It is crucial to allow enough healing and recovery time following a concussion to prevent further damage. Athletes who return to sport before full clinical recovery are at a much higher risk of another concussion that will cause a more severe injury. Research suggests that the effects of repeated concussions are cumulative over time.

Most athletes who experience an initial concussion recover completely if they do not return to sports too soon. Concussion recovery is generally age-dependent with younger individuals requiring more time. For example, 2-3 weeks until recovery for a high school student is not uncommon. It is imperative to treat concussion-related problems early in the course of recovery to help optimize and shorten recovery time. A small percentage 10-15% can take much longer to clinically recover. During this time, the brain may be vulnerable to more severe or permanent injury such as Second Impact Syndrome (SIS). If the athlete sustains a second concussion during this time period, the risk of more severe or lasting brain injury increases.

The Duchesne Academy Concussion Oversight Team consists of:

Dr. Gillian Wooldridge -- Primary Care Sports Medicine – Houston Methodist West Hospital
Kenneth Podell, Ph.D., FACPN – Neuropsychologist – Director of Houston Methodist Concussion Center
Deidre Duke, LAT, ATC – Athletic Trainer – Liaison of Houston Methodist Concussion Center
Rachel Poe, MAT, LAT, ATC – Outreach Athletic Trainer – Houston Methodist West Hospital

Recovery of Concussed Student-Athlete: Return-to-Learn

Due to the complexity of concussion, it is important to recognize that no two concussions are the same and no two student-athletes will have the same symptomatology pattern. Because of this, recovery also varies from person to person and is why time frames for return-to-sport/learn will be individualized. Concussions can generate fatigue and changes in short-term memory, concentration, thinking speed, and executive function that make learning difficult.⁴ With this understanding, recovery and treatment planning, including return to learn will be individualized based upon that student-athlete's symptoms and deficit pattern. Treatment of concussion requires rest, both physical and cognitive, and the return-to-learn process calls for the transition of the student-athlete back to the classroom following concussion. ***As with return-to-sport, the injured student-athlete is not to attend class or participate in classroom activity on the same day as the concussion.*** Following the injury, the student-athlete will be evaluated by their physician of choice, but preferable one that specializes in concussion and academic accommodations and level of physical activity may be recommended. **A clearance document from a parent or guardian who is a physician/healthcare provider will not be accepted.** Re-evaluation will take place if and when symptoms worsen with academic or physical challenges.

Although many student-athletes recover from concussion without or with only short-term academic accommodations, all involved parties will be prepared to provide additional academic support for as long as deemed necessary by the physician. Student-athletes with persisting symptoms should be provided an individualized return-to-learn plan based on

recommendations from the treating physician that will allow for graduated symptom-limited learning activities. Adjustments and accommodations of the return-to-learn plan will be based on patient-specific symptoms, symptom severity, academic demands, and pre-existing conditions such as depression/anxiety, neurological disease/disorder, medical conditions, or attention deficit/hyperactivity disorder.^{1,5}

If the school employs an athletic trainer, they will communicate with the school counselor, treating physician, and the student-athlete’s assigned academic advisor as to the nature of the student-athlete’s diagnosed concussion, individualized initial plan for return to classroom/studying as tolerated and return-to-learn progression. Any academic accommodations or adjustments, including modifying class attendance of the student-athlete, will be communicated to all involved parties via physician note. If no athletic trainer the coach of the athlete will communicate this information. It should be noted that each ***stage during the return to learn protocol can take a few days to complete.***

The protocol below serves as an example of a return-to-learn strategy, following the approximately 24-48 hour period of relative rest:

Step	Aim	Activity (Suggested)	Goal
1	Begin cognitive activities, as tolerated	Short/light cognitive activities. May start with 5-15 minutes of cognitive activities such as reading. May not be able to attend classes.	Gradual return to typical activities without symptom provocation.
2	Cognitive activities outside of the classroom	Homework and reading for short periods (20-30 minutes) with breaks (10-15 minutes) in between. Can attend partial classes sporadically.	Increase tolerance to cognitive activities.
3	Gradual re-introduction to classroom	Partial class attendance or with frequent breaks between classes during the day. Start doing homework in 20-minute intervals with breaks.	Increase academic activities.
4	Full return to normal class schedule	Full class attendance, making up missed or postponed assignments. Still no exams.	Increase academic activities, with progress on missed or postponed tasks.
5	Full return to learn	Full class attendance, current assignments completed as scheduled and starting to complete make-up exams.	Unrestricted academic activities.

UNRESTRICTED RETURN-TO-SPORT SHOULD NOT OCCUR PRIOR TO UNRESTRICTED RETURN-TO-LEARN

Return-to-Sport of an Athlete

A student-athlete that is removed from an athletic practice or competition will not be permitted to practice or compete again until the student-athlete has been evaluated and cleared to begin the school's return-to-sport protocol through a written statement by physician of their choice. The student-athlete must complete the following steps before being allowed to return any practice or competition:

1. The student-athlete and their parent or guardian will have to return the physician's statement indicating that they have been informed and consent to the policies established under the return-to-sport concussion protocol.
2. If the physician note indicates ***"No Concussion" per the state concussion law the athlete must still complete the school's return to sport protocol.*** This will serve as the clearance note.
3. Understand the risks associated with the student-athlete's returning to sport and will comply with any ongoing requirements outlined by the concussion policy.
4. Understands the school's immunity from liability provisions.

The Return To Sport Protocol involves the following steps:

1. The return to sport may be completed under the supervision of the school's athletic trainer, school nurse or coach.
2. The student-athlete must complete the RTS documentation form (symptom assessment) after each step of the RTS protocol.
 - a. The student-athlete must initial each time they complete the RTS documentation.
 - b. Forward completed RTS documentation to the student-athlete's treating physician.
3. Once the RTS protocol has been completed the treating physician must provide a written statement indicating that, in the physician's professional judgment, it is safe for the student-athlete to return to sport.
4. Student-athlete and the parent/guardian have signed the form (Appendix B) acknowledging the completion of the return to sport guidelines which includes understanding the risks associated with the student-athlete's return to sport.

Athletes that have a history of multiple concussions or that have persistent symptoms or indicating cognitive difficulties following concussion will be referred for neurocognitive assessment with a concussion specialist.

Post-Concussion Return-to-Sport Protocol Contact Sports Steps 1-5/Non-Contact Sports Steps 1-4

The return to sport may only be done under the supervision of an athletic trainer, school nurse or team coach.

Step	MHR	Duration	Description
1	50-60%	15-20 min	light aerobic exercise with no resistance training (e.g. walking, low intensity setting for stationary bike and hand bike)
2	60-70%	20-25 min	Moderate aerobic activity with resistance training (e.g. running, light weights – No squat dead lift or bench press)
3	70-80%	25-30 min	High intensity non-contact individual sport specific exercise - no contact drills allowed.
4*		Full Practice (non-contact)	Full NON-CONTACT practice – for contact sports, supervised light contact activities at the end of practice. For example, controlled headers in soccer - AT or coach stands 8-10 feet away from the athlete and tosses a ball 8-10 feet high towards the athlete for 3-5 headers. Football would be 3-5 half-speed/light hits on the sled where the athlete's starting position is 1 foot away.
5*		Full Practice	Full contact practice
6		Full Return	Return to full participation (pending physician clearance)

MHR (Maximum Heart Rate) = 220 – Athlete's age.

***Before beginning Steps 4 & 5 resolution of any symptoms, abnormalities in cognitive function, and any other clinical findings related to the current concussion, including with and after physical exertion.**

After **approximately 48 hours of a relative rest period, athlete may begin with Step 1.** Each subsequent step will take a minimum of 24 hours to complete. **The athlete may be in one Step several days depending on symptoms. If more than mild exacerbation of symptoms** (more than 2 points on a 0-10 scale) the athlete should stop and continue exercising in the same step the next day. If any concussion-related symptoms occur during Steps 4 or 5, they should return to Step 3 to establish full resolution of symptoms with exertion before attempting Steps 4-5 again.

Please Note:

Mild and brief exacerbation of symptoms is an increase of no more than 2 points on a 0-10 point scale lasting less than one hour when compared to baseline value reported prior to physical activity.
SCAT6 - Echemendia RJ, et al. Br J Sports Med 2023; 57:1–3. doi: 10.1136/bjsports-2023-107036

Please note, if a physician note is received that requires the athlete to be in a step longer than one day that must be followed.

Prevention Strategies

Helmets, headgear, and mouth guards do not prevent concussions, but are recommended to prevent serious life-threatening injuries such as skull fractures, facial fractures as well as dental injuries.

1. Insist that safety comes first.
2. Incorporate neck/upper back strengthening into workouts.
3. Teach athletes the dangers of playing with a concussion.
4. All headgear must be NOCSAE certified.
5. Make sure the headgear fits the individual.
6. For all sports that require headgear, a coach or appropriate designee should check headgear before use to make sure air bladders work and are appropriately filled. Padding should be checked to make sure they are in proper working condition.
7. Make sure athletes wear the right protective equipment for their activity (such as helmets, padding and mouth guards).

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Official Acknowledgements

By signing this document all parties agree to the adoption and adherence to the aforementioned Concussion Management Protocol for all Duchesne Academy athletes with a diagnosed or suspected MTBI/concussion.

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