Boston College
Sports Medicine

Guidelines for Care of the Concussed Student-Athlete

This document is for use by Boston College Sports Medicine Clinicians when treating Student-Athletes (S-A's) who have suffered a concussion or are suspected of having suffered a concussion. The term 'Mild Traumatic Brain Injury' (mTBI) is not interchangeable with the term concussion, and will not be used in this document.

Policy Guidelines

Boston College maintains concussion care guidelines based on the most current research and consensus statements from noted experts around the world. This policy is reviewed yearly to ensure that we are following the most current standard of care and that the policy reflects new requirements dictated by both the National Collegiate Athletic Association (NCAA) and the City of Boston's Ordinance for College Athlete Head Injury Game Day Safety Protocol. There is no wording within the NCAA or Boston legislation that allows for 'interpretation' by the clinician in regards to *initial care* of the S-A with a suspected head injury; this policy must be followed to ensure the safety of the S-A and to ensure that Boston College is compliant with NCAA and Boston regulations.

A concussion is considered a complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces. This can be caused by a direct blow or impulsive forces transmitted to the head and typically results in a rapid onset of neurological impairments and clinical symptoms. A concussion is a functional injury, not a structural injury and may or may not include loss of consciousness (LOC). A concussion is not identifiable on standard imaging (CT, MRI).

At no time will any Sports Medicine clinician assign a 'grade' to the concussive injury suffered by a S-A. Although there are a multitude of grading scales that have been created to assist in the diagnosis and management of concussion, these will not be employed by Boston College. Attempting to 'slot' an S-A's injury into one of these scales for the purpose of creating a care plan and a projected timeline places unnecessary restrictions and expectations on the clinician and is not the standard of care.

All NCAA varsity contact/collision sports sponsored by Boston College shall have medically trained personnel present at competitions (on site at campus or venue) and shall have medically trained personnel available for immediate consultation during any practice. These medically trained personnel shall be licensed and/or certified in the diagnosis, treatment and initial management of acute concussion. NCAA contact/collision sports sponsored by Boston College include M&W Basketball, Field Hockey, Football, M&W Ice Hockey, W. Lacrosse, M&W Skiing, M&W Soccer.

Per requirements, any athlete who is deemed to have suffered a concussion, or is suspected of suffering a concussion after experiencing trauma shall be removed from all physical activity for the remainder of that calendar day. Boston College requires evaluation of the athlete, as soon as possible, by a Sports Medicine Clinician. If it is determined that the athlete has suffered a concussion, that athlete will be held from further activity and will be guided and monitored through the protocols outlined in this document. Return to play clearance will be determined by a team physician or appropriately trained and licensed health care clinician and will be documented in writing and provided to the Assistant Athletic Director for Sports Medicine.

The City of Boston Ordinance requires that, specifically for the sports of Football, Ice Hockey and Men's Lacrosse, a "Neurotrauma Consultant" be in attendance at any competition held within the City of Boston. By Ordinance definition, the Neurotrauma Consultant can be a neurologist or a "primary care CAQ sports medicine certified physician that has documented competence and experience in the treatment of acute head injuries". This physician shall have full access to benches and playing surface. Further, this physician will evaluate any suspected head, neck or spine injury suffered by either a home or visiting athlete and will work with the medical staffs present to make recommendations for further care. If visiting teams have medical staff in attendance, they will make the final decision regarding the diagnosis and their athletes playing status.

Pre-Season Education

Student-athletes in each sport will be presented with NCAA concussion fact sheets and educational material on concussions via "Jump Forward" from the compliance office and from pre-season compliance meetings *prior* to practice or competition. Student-athletes will review the material with the understanding that they accept responsibility for reporting all of their injuries and illnesses to the medical staff, including signs and symptoms of concussions. Each student-athlete will initial and sign an acknowledgement of receipt, reading and understanding of concussion education.

Coaches, Sport Administrators, and the Athletics Director will be educated about concussions and the Concussion Safety Protocol as follows: Concussion education will be provided to coaches, Sport Oversight Administrators and the Athletics Director at the beginning of the academic year during an appropriate staff or compliance meeting. Coaches should understand their responsibility for helping to identify student-athletes exhibiting potential signs, symptoms or behaviors consistent with a concussion and getting them evaluated by the Athletic Trainer and/or Team Physician. Coaches will also be educated about strategies that reduce a student-athlete's exposure to head trauma. Coaches, Sports Administrators, and the Athletics Director will sign an acknowledgement of receipt, reading and understanding of concussion education.

Team Physicians and Athletic Trainers will also be provided concussion education material annually and will sign acknowledgement of receipt, reading and understanding of such material.

Initial and Baseline Assessment

All incoming freshmen and all new S-A's will undergo a Sport Pre-Participation Physical through University Health Services. During this physical, the examining physician shall review the S-A's prior medical history including any history of brain injury or concussion as well as any current symptoms. Those S-A's reporting prior head injury will be asked to provide a thorough history of their previous concussive incidents including dates incurred, length of symptoms, and time missed from athletics and academics. Each S-A will be administered a baseline Standard Assessment of Concussion. A balance screening shall also be administered by the examining physician or athletic training staff. Those S-A's who are participating in contact and collision sports will also undergo computerized neurocognitive testing prior to participation. The Boston College sports that are classified as contact and collision are listed below. The results of these tests will be recorded in the S-A's medical chart. The examining physician will make a determination for clearance to participate or for the need of any type of specialized follow-up consultation related to pre-existing conditions and/or prior history of head injury.

The sports which will be required to undergo computerized neurocognitive baseline testing include:

Baseball	Field Hockey	W Lacrosse	M & W Skiing
M & W Basketball	Football	Pole Vaulting	Softball

Diving M & W Ice Hockey M & W Soccer

Any athlete that has suffered a documented concussion and that has experienced a complicated, non-linear, or lengthy return to play progression, or has suffered multiple concussions while at Boston College shall undergo new baseline testing after six months (or longer) from the date of clearance.

Evaluation/Diagnosis

Signs and Symptoms of Concussion

Below is a list of signs and symptoms that may be used by the clinician to assist in the initial evaluation of the head injured S-A. This list is extensive but not all-inclusive and should serve only to provide 'triggers' that may be used for identifying the S-A with a concussion. A similar, but more specific list will be utilized for follow-up with the concussed S-A. Understand that symptoms may vary over time and serial monitoring will occur regularly to further assess neurocognitive status. Re-evaluation is recommended daily in the initial post injury phase due to the variable sequelae that may ensue.

Physical	Cognitive	Emotional	Sleep
Headache	Difficulty remembering	Behavioral changes	Sleep more than usual
Fatigue	Difficulty concentrating	Irritability	Sleep less than usual
Dizziness	Feeling slowed down	Sadness	Drowsiness
Photophobia	Feeling in a fog	Feeling emotional	Trouble falling asleep
Sensitivity to noise	Slowed reaction times	Nervousness	
Nausea	Altered attention	Anxiety	
Balance problems	Amnesia		
LOC			
Vision difficulty			

Acute/Emergency Evaluation and Care (Sideline/Bench – immediately post injury)

At any time that a concussion is suspected, the S-A shall be removed from further participation and undergo an initial concussion evaluation.

If the S-A is conscious and alert and without evidence of other limiting injuries (i.e. c-spine injury), they will be removed to the sideline/bench/athletic training room for evaluation. At that time the clinician will, at a minimum, perform the following exam:

-The injury history, date/time, and history of previous concussion will be determined and recorded including any loss of consciousness
-An initial injury verbal symptom checklist will be utilized to record any symptoms reported by the S-A.
-A basic neurologic exam will take place assessing cranial nerves
-The SAC will be administered
-Upper and lower extremity coordination will be assessed.
-Pupils shall be examined for size, shape and reaction to light.

If the athlete is symptomatic and the clinician determines that the athlete is concussed, serial monitoring will occur at regular intervals (approx. every 10 minutes) until symptoms stabilize or improve. Serial monitoring will be recorded and should include time of day and any change in symptoms or status of athlete. Depending on sport, timing, and location, the helmet may be taken away from the injured player. Once symptoms stabilize, the

player will continue to be monitored at regular intervals but shall not return to practice, play, or perform any other type of physical activity that day.

Findings of this initial assessment and serial monitoring will be recorded on a Sideline Head Injury Evaluation Card (see attachments) or on a similar smart phone application which can later be transferred into the S-A's medical record.

The Emergency Action Plan shall be initiated and the S-A should be removed from the venue utilizing c-spine precautions as needed and transported to the closest emergency department if any of the following are present:

-Prolonged Loss of Consciousness (LOC)
-Focal neurologic defect as found with intracranial injury
-Repeated or worsening emesis
-Significant alteration or deterioration in mental status
-Glasgow Coma Scale score of less than 13

Sub-Acute Evaluation (Controlled/Quiet Environment – ideally within 1-2 hours of injury)

After the initial acute evaluation, the clinician shall perform a more in-depth evaluation of the head injured athlete in a more stable environment such as the Athletic Training Room, locker room or clinic. The Assessment of Concussion form shall be utilized for this evaluation (see attachments). This form includes a graded symptom checklist that should be completed by the S-A with assistance of the clinician as needed. Depending on the time elapsed since the SAC was initially administered in the acute evaluation, another SAC may be required. Additional neurological exams will take place to evaluate the status of the S-A. If the clinician is a physician, the form should be completed in its entirety, if the clinician is an athletic trainer, the form shall be completed as fully as possible with the understanding that some of the assessments will not be carried out. If the athlete reports to be symptom free and the remainder of the exam is normal, the clinician may choose to engage the athlete in exertional maneuvers and then reassess symptoms.

Also at this time, a care plan will be discussed. If this sub-acute exam was not completed by a team physician, a follow-up physician exam will be required as soon as possible (and within 48 hours). Depending on signs and symptoms from this sub-acute exam, the clinician may opt to require the S-A to be observed at a health care facility. (On-Campus Health Services, Local Hospital) If the S-A is allowed to return to their room, specific timing and location of the next follow-up exam will be discussed with the S-A. Further, the S-A and another responsible adult will be provided with the Concussion Home Instruction Sheet (see attachments) and will be provided with contact information and instructions in the event that the S-A's condition worsens. The clinician should review the home instructions with the S-A, with emphasis given to cautions regarding medication (no NSAIDs) and activity levels, both physical and cognitive (see below).

Sub-Acute Care and "Return-to-Learn"

Along with the follow-up exam already mentioned above, the S-A will be instructed in appropriate behaviors in order to maximize healing conditions for concussion. This will include continued physical rest and also cognitive rest. The athlete will be instructed to limit reading, 'screen time' (texting, video game play, computer work) and any other cognitive activity that requires focus/concentration. Learning Resources for Student Athletes (LRSA) will be alerted to the extent of the injury in order to assist with the cognitive rest recommendations. The athlete will be required to discuss a "Return to Learn" plan with both Team Physicians and their LRSA Learning Specialist Advisor who will serve as the 'point person' for handling needed academic accommodations. If needed the athlete may initially be housed in a low-sensory environment at University Health Services if cognitive activity increases symptoms. The goal of LRSA and team physicians will be to assist the S-A to minimize cognitive stress while making an attempt to stay current academically. The LRSA

Advisor shall make recommendations regarding the resumption of class work and class attendance in a gradual fashion for a period of up to two weeks. In their ongoing monitoring of the concussed S-A, the team physicians, in conjunction with the LRSA Advisor, will make recommendations for continued or increased assistance from University staff as well as off-campus resources to assist with any prolonged Return-to-Learn issues that might continue beyond the initial two week period post-injury. However, increased assistance may be sought out at any time during the monitoring of the S-A's recovery as determined by team physicians or the LRSA Advisor. All recommendations suggested by on-campus and/or off-campus clinicians shall adhere to the ADA Amendments Act of 2008. On-campus resources include Disability Services Office, The Connors Learning Center, University Counseling Services and Office of the Academic Deans. Off-campus resources would initially include the Concussion Neuropsychology Group at Children's Hospital with referral to other expert clinicians as needed.

Follow-Up Evaluation & Care

The concussed S-A shall be re-evaluated within (or close to) 24 hours post injury. At this time, the Concussion Follow-Up Assessment Form and Self-Report Symptom Scale document will be utilized for the exam (see attachments). All clinicians should note that on this form the self-report symptom scale is **NOT** graded on **severity of symptoms** but rather on **duration of symptoms**. This must be explained carefully to the S-A and a time frame for symptom report must be selected and noted on the form. Because the scale is different than that employed during the sub-acute exam, the total symptom score should not be compared between these two exams.
When utilizing this follow-up form, the clinician should take into account the timing of the administration of the self-report in regards to the length of time that the S-A has been awake and whether or not the S-A is utilizing any medication that may mitigate symptoms. The form should be completed with care being taken to note any changes in the S-A's condition as well as documentation of the next time and location for serial follow-up evaluation.

Daily monitoring of the concussed S-A shall continue and the Concussion Follow-Up Assessment Form and Self-Report Symptom Scale shall again be employed during these evaluations.

ImPACT neurocognitive testing will be carried out on physician recommendation only after the acute and sub-acute symptoms have resolved and the athlete has completed at least the initial two steps of the Return to Play Protocol. The athlete should not undergo ImPACT testing during the initial post-injury phase. Comparison of the ImPACT scores will be made with baseline scores if available or with normative data. The neurocognitive testing results will assist the overall evaluation of the S-A but will not serve as the only measure of progress nor as the only indicator for return to play clearance.

The team physicians shall continue daily monitoring until such as time as the S-A has successfully completed all evaluations, testing values have returned to levels at or near baseline and the S-A has successfully completed the Return-to-Play progression outlined below. If the S-A is experiencing a prolonged recovery and has not been cleared to return to play and/or is still experiencing cognition issues related to Return-To-Learn, team physicians shall convene to discuss additional differential diagnoses as well as other evaluative and care options. As described previously, off-campus resources would initially include the Concussion Neuropsychology Group at Children's Hospital with referral to other expert clinicians as needed.

Return to Play Considerations

The Return to Play (RTP) protocol following a concussion follows a stepwise progression and is not initiated until approximately 24 hours after the S-A is asymptomatic and other neurological evaluations are considered back to normal. A physician must approve the commencement of the RTP progression. The progression outlined below is to be carried out in a step-wise fashion with constant monitoring both before and after activity by a sports medicine clinician. The Concussion Follow-Up Assessment Form and Self-Report Symptom Scale will be used again after each step. If recurrence of symptoms is noted and/or a change in the neurological exam occurs, the athlete will again be held from activity for approximately 24 hours and re-evaluated. If the symptoms have resolved, the athlete will drop back to the previous step and be allowed to resume the progression. Integration of two steps within a 24 hour period is permissible only with physician approval.

Step 1 – Light aerobic exercise to increase heart rate (walking, stationary bike, elliptical, etc.)

Step 2 – Sport specific cardio activity (ex: skating, running)

Step 3 – Progressive resistance exercise

Step 4 - Non-contact practice

Step 5 – Return to full contact play with clearance by physician

***While self-evident when following all of the guidelines outlined in this document, it should be noted that at no time will a Student-Athlete be allowed to return to play if they still require academic adaptations or accommodations related to their concussion**.

Special Considerations

The sports medicine clinician may consider obtaining a neurological consult or an adjustment of the RTP progression in certain situations. Find below a list of some of those situations that may warrant a change in the normal protocol.

- Structural Head Injury
- Multiple Concussions
- Extensive duration of symptoms at any point post injury
- Significant amnesia or LOC greater than 1 minute
- Co-morbidities such as a past history medical history of migraine, depression, ADHD, sleep disorder, and/or other mental health issues

Summary

It is important to note that concussion evaluation and management must be handled on a case-by- case basis. There is no 'typical' clinical course for the resolution of the injury itself and the post concussive management. In following the mission of Boston College Sports Medicine, we will protect and promote the safety, health and well being of every student athlete and will provide and coordinate the care of our athletes while working with

our coaches as they prepare for athletic competition. Post concussive care will focus on limiting the potential catastrophic and long term risks involved with concussive injuries. The evaluation, care and return to play decisions will be based on current best medical practices and the clinical judgments made by Boston College clinicians specifically for each injured individual.

The above policy and protocols will be reviewed by the Director of Health Services, the Medical Director of Athletics, Team Physicians and Sports Medicine Staff. This review will occur yearly in July and the policy will be updated to reflect current best-practices for care of head-injured athletes. Further, the policy and protocol will be reviewed and updated at anytime as needed to insure that the document meets the requirements of all governing bodies including but not limited to; the University, the National Collegiate Athletic Association, the City of Boston and the City of Newton.

Emergency Action Plans

Find following the Emergency Action Plans (EAP's) for the various venues utilized by Boston College athletic teams for both practices and competitions.

It should be noted the Emergency Action Plans are venue (site) specific. They are **not** sport specific, nor are they activity specific (i.e., practice v. game v. running workout v. coaches skill work, etc.), nor are they injury specific (i.e., concussion v. cardiac v. orthopedic, etc.)

The EAP's are documents to be used by any individuals or groups affiliated with Boston College that are using a Boston College athletic venue, or an off-campus public or private venue utilized by Boston College athletic teams. The plans are designed to assist on-site staff in the event of any type of medical emergency. The EAP is specifically designed to be direct, succinct and related only to initial emergent care. *The EAP is not a protocol for dealing with specific injuries or conditions*. (See related documents for policies and protocols regarding specific injuries or conditions)

All staff utilizing venues should be familiar with the EAP for that venue. When possible, the EAP will be posted in a prominent location at each venue.

Emergency Action Plans Attached:

Alumni Stadium
Community Rowing Boat House
Conte Forum: Main Floor or Ice Surface
Conte Forum: Power Gymnasium
Flynn Recreational Complex
Newton Campus Short Turf Field
Newton Campus Long Turf Field
Savin Hill Yacht Club
Shea Field

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