



Concussion Management Plan

The following policy and procedures regarding the management of concussions encompasses the NCAA recommendations regarding management of concussions in intercollegiate athletics. The guidelines include the staff Athletic Trainer's role in concussion management, concussion assessment procedures (immediate and subsequent), referral requirements, neurocognitive baseline and post injury testing, as well as, return to play guidelines. The concussion guidelines have been developed in accordance with the mission of the Sports Medicine-Athletic Training Department at Bridgewater State University to provide quality athletic healthcare services and to assure the well-being of each student-athlete.

I. Purpose:

The BSU Sports Medicine-Athletic Training Department recognizes that sports related concussions pose a significant health risk for student-athletes. In accordance with the NCAA, the Sports Medicine~Athletic Training Department has implemented policies and procedures to deal with the assessment, management, and return to play (RTP) considerations for student-athletes who have sustained a concussive episode.

II. Definition of terms:

Concussion - A complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces.

- Direct blow or impulsive forces transmitted to the head
- Typically results in rapid onset of neurological impairments
- Functional injury: Not a structural injury
- May or may not include loss of consciousness (LOC)
- Not identifiable on standard imaging (CT, MRI)

Mild Traumatic Brain Injury (mTBI)

- All concussions are a form of mTBI,
- Not all mTBI's are concussions.
- The terms mTBI and concussion should NOT be used interchangeably.

Post Concussion Syndrome

- A set of symptoms which may last for weeks, months, or years following a Concussion

Second Impact Syndrome

- Rare condition when an athlete sustains a second head injury before symptoms from the first have resolved. Second Impact Syndrome is often fatal.

III. Signs and Symptoms of Concussion

Certified athletic trainers and athletic training students need to be aware of the potential signs and symptoms of concussion in order to properly diagnosis the injury and begin formal management. Symptoms can take seconds to hours to develop following a concussive injury.

<u>Physical</u>	<u>Cognitive</u>	<u>Emotional</u>	<u>Sleep</u>
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			

IV. Baseline Assessment

All first year and 3rd year student athletes who are participating in sports identified as collision or contact or those who have had previous concussions identified by their health history will undergo baseline testing. Currently the BSU Sports Medicine-Athletic Training Department utilizes the ImpACT™ concussion management system (impacttest.com) for the neurocognitive testing. The ImpACT™ system is a user friendly computer based program which has 10 modules designed to test multiple aspects of neurocognitive functioning. All incoming first year student athletes will also have balance assessed using the BESS balance test as well. The sports which currently undergo baseline testing include:

Football	Field Hockey	M & W Soccer	Volleyball
M & W Basketball	Diving	Wrestling	
W Lacrosse	Baseball	Softball	

V. Management

In any circumstance where a concussion is suspected, the first priority is to remove the athlete from further participation until a thorough sideline exam can be performed. If the BSU staff Athletic Trainer determines that the student athlete has sustained any level of concussion the student athlete MUST be removed from practice and/or competition that day. Further evaluation by BSU staff ATC will determine need for referral to physician based on signs and symptoms that present from the time of injury and in subsequent assessments.

A. Automatic Referral to outside medical include (this is not an all inclusive list for medical emergencies it specifically relates to concussion, mTbi and Tbi):

- 1) Loss of Consciousness for more than 1 minute.
- 2) Suspected Spinal injury
- 3) Progressive symptoms of increasing intracranial pressure

B. On Field / Sideline Evaluation:

- 1) In all cases in which a concussion is suspected the athlete will be removed from athletic participation and a formal evaluation will take place. The athlete will **NOT** be allowed to participate further in a practice or contest on the day of the injury.
 - a) The athlete will be removed from field utilizing c-spine precautions and transported to emergency department if presents with:
 - i) Prolonged LOC and/or
 - ii) Focal neurologic defect and/or
 - iii) Significant alteration or deterioration in mental status and/or
 - iv) Complaints of spinal pain.
 - b) The athlete will be assisted to sideline for evaluation if he/she is:
 - i) Conscious and alert
 - ii) Exhibits no signs or symptoms of significant concussion or spinal injury
- 2) Sideline evaluation:
 - a) Injury history (Hx), date/time, previous concussion Hx recorded, etc.
 - b) Graded symptoms checklist
 - c) Neurologic exam
 - i) Cranial Nerve Assessment
 - ii) Upper and lower quarter screening
 - iii) Vital sign assessment
 - d) Neurocognitive test – series of questions (SCAT2 test if available) for cognitive function and memory.
 - e) Neuromotor examination – finger to nose, rhomberg’s test, heel/toe walking, modified BESS
 - f) Neuromotor/cognitive test – combining motor skills with cognitive assessment
 - g) Vestibular Ocular Motor Assessment
- 3) Following the sideline evaluation, continuing serial monitoring and documentation every 5 minutes until signs and symptoms stabilize or improve.
- 4) A BSU concussion management packet will be started for the student athlete. This is a comprehensive packet that contains all the assessment information, checklist/log to document progress, the return to play protocol, home care instructions and academic initial notification letter (latter 2 to be given to student athlete on day 1 of suspected concussion).

C. Subsequent Clinic Evaluation:

- 1) Any BSU student athlete who has sustained a concussion will be required to report to the BSU Athletic Training Facility or equivalent if traveling for more formal evaluation following practice/contest.
- 2) Clinic evaluation will consist of:
 - a) Injury history (Hx), date/time, previous concussion Hx recorded, etc.
 - b) Graded symptoms checklist
 - c) Neurologic exam
 - i) Cranial Nerve Assessment
 - ii) Upper and lower quarter screening
 - iii) Vital sign assessment
 - d) Neurocognitive test – series of questions (SCAT2 test if available) for cognitive function and memory.
 - e) Neuromotor examination – finger to nose, rhomberg’s test, heel/toe walking, modified BESS, BESS test as appropriate
 - f) Neuromotor/cognitive test – combining motor skills with cognitive assessment
 - g) Vestibular Ocular Motor Assessment
- 3) The athlete will be scheduled for ImPACT testing after 48 hours of the injury
- 4) Referral to outside medical provider if deemed necessary
- 5) The athlete will be given a home care sheet, and given instructions on what to do should their condition deteriorate, as well as, the academic notification letter.

D. Treatment / Rehabilitation

- 1) BSU athletes who sustain a concussion will be instructed to rest, meaning total rest initially:
 - a) Physical rest
 - No athletic participation
 - No recreational exercise during acute symptoms
 - b) Cognitive rest
 - Limit scholastic work
 - Limit video games
 - Limit text messaging and computer use

E. Follow up Evaluation(s)

- 1) Student athletes who have sustained a concussion will be required to follow up with a Staff Athletic Trainer daily
- 2) Follow up evaluation will consist of completing the BSU concussion follow-up form which Includes:

- a) Graded symptom check list
 - b) Neurologic exam
 - c) Neuromotor/cognitive exam
 - d) Balance Assessment
 - e) Vestibular Ocular Motor Assessment
- 3) Once the athlete is asymptomatic they can then be retested on ImPACT (2nd time since onset of injury)
 - 4) Once the athlete is symptom free and back to baseline values with all testing they may begin a supervised graduated RTP protocol.
 - 5) If upon exertion any symptoms return, the activity is stopped and graduated exertion level will be reassessed the next day.

F. Grading Concussions:

The grading of concussions at the time of injury, and even prior to their resolution, is not appropriate. Therefore concussions will not be given a grade or number until the concussion has completely resolved. Many of the factors in grading a concussion depend on the severity and duration of symptoms which cannot be determined until the athlete is asymptomatic both at rest and with exertion.

G. Special Considerations

1. Medications :

Are usually not needed but in some cases may be needed when considering sleep and headaches. If the athletic trainer or physician allows the athlete to take medication, only Tylenol (acetaminophen) should be used. Aspirin and NSAIDs should **NOT** be used by the athlete. The Team Physician will determine what supportive supplements and medicines are taken.
*note that the athlete should not be using medication when assessing symptoms and RTP.

2. Academic Support:

When necessary academic support can be coordinated with the help of a Bridgewater State Athletics Department Administrator and the BSU Academic Achievement Center.

H. Physician/Neurologist Medical Clearance:

Will be required for the following situations prior to RTP:

- Multiple Concussions, in season and/or career
- Duration of symptoms greater than 10 days
- LOC greater than 1 minute
- Convulsions
- Two concussive episodes close together, and/or recent TBI
- Athlete suffering from Post Concussion Syndrome
- Athlete currently taking psychoactive drugs, anticoagulants

VI. Return to Play Considerations

General return to play (RTP) guidelines vary depending on severity of concussion, time between concussions and frequency of concussions. As a general rule a first Grade I (mild/simple) concussion will require the student athlete to be out of participation 1 week after symptoms (at rest and with exertion) subside. A first grade II (moderate) concussion will require 2 weeks after symptoms (at rest and with exertion) subside. Any student athlete with a concussion greater than grade I (mild/simple) and/or with any significant or recent history of concussions will be referred to a physician and will need medical clearance from that physician to return to play. Once medical clearance is obtained from the treating physician, the stepwise progression to return to play will commence, unless it has begun already.

RTP protocol following a concussion follows a stepwise progression. The athlete should be symptom free and have returned to baseline values (symptoms inventory and Impact testing) before beginning this progression. The athlete must complete each level and progress to the next if they remain asymptomatic both at rest and with provocative exercise. Generally, each step should take about 24 hours. Should the athlete become symptomatic during the progression, they will have to try to progress after a 24 hour period of rest.

Stepwise Progression General Guidelines:

Recommended Protocol. Can utilize others available that offer objective measure and appropriate stepwise progression

Stage 1 –

Target Heart Rate : 30-40% of maximum exertion

Recommendations: 10-15 minutes of cardio exercise; low stimulus environment; no impact activities; balance and vestibular treatment (prn); limit head movement/ position change; limit concentration activities

- Very light aerobic conditioning
- Sub-max strengthening
- ROM/ Stretching
- Very low level balance activities

Stage 2:

Target Heart Rate : 40-60% of maximum exertion

Recommendations: 20-30 minutes of cardio exercise; exercise in gym areas; use various exercise equipment; allow some positional changes and head movement; low level concentration activities

- Moderate aerobic conditioning
- Light weight strength exercise
- Stretching (active stretching initiated)
- Low level balance activities

Stage 3:

Target Heart Rate: 60-80% of maximum exertion

Recommendations: any environment ok for exercise (indoor,outdoor); integrate strength, conditioning, and balance /proprioceptive exercise; incorporate concentration challenges

- Moderately aggressive aerobic exercise
- All forms of strength exercise (80% max)
- Active stretching exercise
- Impact activities running, plyometrics (no contact)
- Challenging proprio-balance activities

Stage 4: (Sports Performance Training)

Target Heart Rate: 80-90% of maximum exertion

Recommendations: continue to avoid contact activity, resume aggressive training in all environments

- Non-contact physical training
- Aggressive strength exercise
- Impact activities/ plyometrics
- Sports specific training activities

Stage 5: (Sports Performance Training)

Target Heart Rate: Full exertion

Recommendations: Initiate contact activities as appropriate to sport activity; full exertion for sport

- Resume full physical training activities with contact
- Continue aggressive strength/conditioning exercise
- Sport specific activities

The BSU Stepwise Progression includes 6 graduated, supervised steps that incorporate a combination of general aerobic cardio exertion, cognitive-motor assessment, vestibular ocular motor assessments, BESS testing, Auditory-motor assessment, sports specific skill exertion and progressing to partial practices, full practices and full participation in contests – all concluding with symptom inventories to monitor the potential return of symptoms.

Continued post-concussive symptoms, prior concussion history and any diagnostic testing results along with neurocognitive and neuromotor/cognitive testing and physical exam, will be utilized by the team physician and athletic trainer in establishing a timeline for an athlete's return to activity. The baseline data along with physical exam, any diagnostic testing, symptom inventories, follow up testing and a gradual RTP protocol will all be used in conjunction with sound clinical judgment and on an individualized basis to determine when it is safe for an athlete to return to participation. It is important to note that this timeline could last over a period of days to weeks or months, or potential medical disqualification from Bridgewater State University athletics. All cases will be handled on an individualized basis. The decision by the Team Physician for all cases of an athlete's return to activity is final.

VII. Education and reporting

A. Education:

Student Athletes review concussion educational material as part of the medical clearance process each year. Coaches, administrators and sports medicine staff review the educational information regarding concussion signs/symptoms, management and reporting annually. Educational material is also posted in each of the Sports Medicine-Athletic Training facilities.

B. Reporting of concussions:

Student Athletes sign a statement acknowledging the importance of reporting injuries, including concussions as part of the medical clearance process. Coaches are reminded of the importance of timely reporting of injuries annually in the Sports Medicine section of the Athletic Department Coaches handbook, in the concussion education material and at the bi-annual coaches meetings.

VIII. Summary

The Bridgewater State University Sports Medicine~Athletic Training Department is proactive in the prevention, recognition, and management of concussions in order to limit the risks of concussions associated with athletics participation. The BSU concussion management plan is comprehensive and includes current protocols and guidelines as set forth by the NCAA and the NATA. The management and return to play decisions will remain in the realm of clinical judgment on an individualized basis by both the certified athletic trainer and the team physician.

IX. References

NCAA Sports Medicine Handbook, 2014-15.

NATA Position Statement: Management of Sport Related Concussion, 2004

American Academy of Neurology. Practice Parameter: The management of concussion in sport.

Cantu, Robert. Return to Play Guidelines After a Concussion. 1998.

CDC Physician Toolkit (Collins, Gioia, et al. 2007)

Consensus Statement on Concussion in Sport – The 3rd International Conference on Concussion in Sport held in Zurich