



Policy Title: Concussion Safety Protocol
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GOALS OF THE POLICY

- Standardized approach to head injury and possible concussive injury to protect the health and welfare of student athletes.
- Comprehensive baseline and post-injury evaluations for head injuries and concussion in the student athlete.
- Individualized return to academics and return to sport for athletes with concussive injury.
- Provide educational information to athletes, coaches, administrators, healthcare providers and others involved in the health and wellbeing of athletes regarding concussion.

POLICY

Princeton University Athletic Medicine (PUAM) has a comprehensive program regarding head injury and possible concussive injury that includes education, a baseline assessment, a post-injury evaluation, and an individualized return to academics and sport management program. This is referred to as the PUAM Concussion Management Policy.

Definition of Sport-Related Concussion

The Consensus Statement on Concussion in Sport, which resulted from the 6th international conference on concussion in sport, defines sport-related concussion as follows:

Sport-related concussion is a traumatic brain injury caused by a direct blow to the head, neck or body resulting in an impulsive force being transmitted to the brain that occurs in sports and exercise-related activities. This initiates a neurotransmitter and metabolic cascade, with possible axonal injury, blood flow change and inflammation affecting the brain.

Symptoms and signs may present immediately, or evolve over minutes or hours, and commonly resolve within days, but may be prolonged.

No abnormality is seen on standard structural neuroimaging studies (computed tomography or magnetic resonance imaging T1- and T2-weighted images), but in the research setting, abnormalities may be present on functional, blood flow or metabolic imaging studies.

Sport-related concussion results in a range of clinical symptoms and signs that may or may not involve loss of consciousness.

Policy Title: Concussion Safety Protocol

The clinical symptoms and signs of concussion cannot be explained solely by (but may occur concomitantly with) drug, alcohol, or medication use, other injuries (such as cervical injuries, peripheral vestibular dysfunction) or other comorbidities (such as psychological factors or coexisting medical conditions).

PROCEDURES

1. Administrative Issues

- a. Injury in Sport Emergency Response Plan (ISERP) for all venues including a Concussion Plan
- b. Education of Athletic Trainers (AT's), team physicians, Coaches and Administrators regarding ISERP & the PUAM Concussion Management Policy. This includes allowing an opportunity to discuss this information.
- c. Provide concussion education for student athletes, coaches, administrators, ATs, and team physicians as well as others involved in health and safety decision-making. This includes recognizing common signs & symptoms, and the importance of prompt reporting of symptoms, properly fitting equipment, and avoiding high-risk sport activities (e.g. leading with the head). This education includes allowing an opportunity to discuss this information.
- d. Pre-participation Physical Examinations performed for all varsity athletes and club rugby athletes.
- e. Acknowledgement of "Student Athlete (SA) Agreement" during all First year/Initial and Returner Physical Examinations that includes the following language: "By checking the box below, I acknowledge that I understand that there are certain risks involved in participating in Athletics at Princeton University, including those associated with head injuries and concussions. Although there are some contact and collision sports that inherently have a higher risk of head injury and concussion than others, these are important injuries for all student-athletes. I agree to report all signs and symptoms of my injuries to the Princeton University Athletic Medicine/Athletic Training staff immediately. Additionally, I will help protect my teammates by reporting their signs and symptoms to the Athletic Medicine/Athletic Training staff. I understand that each head injury is different, and that each injury will be treated individually, with each return to play decision made on an individual basis. By signing this, I agree to follow the direction of treatment and care designated by the Princeton University Athletic Medicine Staff. I understand that I must be cleared by a Princeton University Athletic Medicine physician before returning to competition."
- f. Acknowledgement of Coaching & Support Staff (coaches, administrators, athletic trainers, team physicians). Agreement regarding receiving education regarding the signs and symptoms of concussion, the importance of early reporting, and the PUAM Concussion Management Policy.
- g. AT's present for all at-risk competitions and available for all at risk practices; physicians present or available for at risk home varsity competitions.
- h. Documentation of baseline testing (most current version of the Sport Concussion Assessment Tool (SCAT)), initial injury evaluation (SCAT & other) as well as follow up SCAT symptom checklist and documentation of academic issues. Documentation (AT & team physician) of initial & subsequent evaluations, change in status regarding

Policy Title: Concussion Safety Protocol

activities (return to play / academic progress) and final clearance to return to play.

Documentation of interpretation of any post-injury neuropsychological testing by our outside consulting neuropsychologist, as well as any other consultant notes.

- i. PUAM Concussion Education Information Sheet (Attachment 1) given to SA that have sustained a concussive injury.
- j. Understand importance of education, technique training, early recognition and reporting, following league and NCAA rules and promoting fair play in potential prevention of concussion.
- k. As required by NCAA Independent Medical Care legislation, team physicians and athletic trainers shall have unchallengeable autonomous authority to determine medical management and return-to-activity decisions, including those pertaining to concussion and head trauma injuries, for all student-athletes.

2. PUAM Pre-Participation Exam: 1st year SA's

- a. Includes questions regarding possible “modifiers”: prior history of concussion or brain injury, neurologic disorder, attention deficit hyperactivity disorder (ADHD) or learning disabilities, headache or migraines, depression, anxiety or other mental health disorder, or seizure disorder.
- b. Baseline SCAT (includes symptom checklist, brief cognitive evaluation and balance assessment) performed for all varsity athletes and club rugby and computerized neuropsychological (NP) testing (e.g. “Immediate Post-Concussion Assessment and Cognitive Testing” (ImPACT)) performed for all at risk sport athletes (Football, Field Hockey, Wrestling, Baseball, and Softball, as well as Men’s & Women’s Soccer, Basketball, Lacrosse, Ice Hockey, Water Polo, Pole Vaulting, and Club Rugby).
- c. If any athlete has a significant history of prior concussion(s), recent concussion, or significant other “modifiers”, the team physician may request that NP testing include computerized neuropsychological testing (e.g. ImPACT) as well as additional paper & pencil (P & P) tests and may request additional consultation and/or testing.

3. Recognition and Diagnosis of Concussion

- a. Medical personnel with training in the diagnosis, treatment, and initial management of acute concussion will be present at all NCAA competitions in the following contact/collision sports: baseball; basketball; diving; field hockey; football; ice hockey; lacrosse; pole vault; rugby; soccer; softball; volleyball; water polo; wrestling).

NOTE: To be present means to be on site at the campus or arena of the competition.

- b. Medical personnel with training in the diagnosis, treatment, and initial management of acute concussion will be available at all NCAA practices in the following contact/collision sports: baseball; basketball; diving; field hockey; football; ice hockey; lacrosse; pole vault; rugby; soccer; softball; volleyball; water polo; wrestling).

NOTE: To be available means that, at a minimum, medical personnel can be contacted at any time during the practice via telephone, messaging, email, beeper or other immediate communication means and that the case can be discussed through such communication, and immediate arrangements can be made for the athlete to be evaluated.

4. Sideline Evaluation:

- a. When an athlete exhibits signs or has symptoms of suspected concussion after a blow to the head or body, they must be removed from play and not allowed to return to play until evaluated by a licensed health care provider.
- b. Evaluation must be by an athletic trainer or team physician (or physician designee) with concussion experience.
- c. Signs that warrant immediate removal from the field include actual or suspected loss of consciousness, seizure, tonic posturing, ataxia, poor balance, confusion, behavioral changes and amnesia.
- d. Any SA with the following **“red flag” signs** must be removed from play for immediate medical assessment. In the event of need for emergency transport to the hospital, activate the venue specific ISERP.
 - o Neck pain or tenderness*
 - o Seizure or convulsion
 - o Double vision
 - o Loss of consciousness
 - o Weakness or tingling/burning in more than 1 arm or in the legs.
 - o Deteriorating conscious state
 - o Vomiting
 - o Severe or increasing headache.
 - o Increasingly restless, agitated or combative
 - o GCS < 15
 - o Visible deformity of the skull

*Any SA with neck pain should be treated as if a cervical spine injury is present, and emergency procedures (cervical spine motion restriction, emergency room transfer) considered or initiated.

- e. For SA transported to the emergency room, whether by public safety or ambulance, contact the infirmary unit of UHS (609-258-3139 or 609-258-3141) to provide them with this information.
- f. If no AT or team physician is available, and the athlete has minimal symptoms, contact the AT/team physician to determine a plan for evaluation of the athlete. If you are unable to contact the PUAM staff, contact UHS at 609-258-3139 or 609-258-3141. Tell the inpatient/front desk staff that this is a student athlete. Public safety should be called for transportation.
- g. For away contests when an AT is not available, the host institutions medical staff should be utilized. Contact the AT/ team physician to let them know that the host institution’s medical staff has been consulted.
- h. If an AT is on-site and the SA is medically stable, SCAT (or similar instrument that includes Glasgow Coma Scale, Maddock’s questions, cervical spine and brief neurological exam, symptom checklist, balance assessments) should be used for the evaluation of the injured athlete.
- i. Allow ample time (up to 10-15 minutes) when conducting a multimodal screen (e.g., SCAT6) to evaluate a potential concussion.

Policy Title: Concussion Safety Protocol

- j. If an AT is on site and the assessment is concussion or the athlete is evaluated by the team physician and/or other clinician (including host institutions medical staff) and the diagnosis is concussion, the athlete cannot return to play the same day.
- k. Provide SA with PUAM Concussion Education Information once diagnosis is made. If SA is traveling for away contests without an AT, the information sheet should be provided by the AT as soon as possible.

5. Management:

- a. **Physician evaluation of all athletes with suspected concussion**, timing dependent on AT assessment & clinical judgment. The AT should contact the team physician to discuss follow up care.
- b. **The team physician will:**
 - i. Determine if additional testing or consultation is indicated, particularly if a student athlete has an atypical presentation or persisting symptoms lasting >4 weeks, and consider additional diagnoses including but not limited to:
 - o Fatigue and/or sleep disorder
 - o Migraine or other headache disorders
 - o Mental health symptoms and disorders
 - o Ocular dysfunction
 - o Cervical and vestibular dysfunction
 - o Cognitive impairment
 - o Autonomic dysfunction, including orthostatic intolerance and postural orthostatic tachycardia syndrome.
 - o Pain
 - ii. Educate SA regarding the importance of reporting all symptoms.
 - iii. Review PUAM Concussion Education Information.
 - iv. Determine if any academic accommodations are necessary (e.g. refer to Dean, Assistant Dean for Studies, Office of Disability Services) and communicate with others, following privacy rules/regulations (e.g. coaches, parents, Deans).
 - v. Document that post-concussion plan of care was communicated to both the student-athlete and another adult responsible for student-athlete, in oral and/or written form, as indicated.
- c. **The student athlete will:**
 - i. Contact his/her Dean, Assistant Dean for Studies, and the Academic-Athletic Advisor (per the PUAM Concussion Education Information) regarding their diagnosis and provide permission to discuss the diagnosis with the team physician.
 - ii. Report to the AT and team physician, as instructed, for follow up visits.
 - iii. Report any signs or symptoms and any academic concerns to the AT and team physicians.

6. Follow up Care:

- a. Daily symptom checks will be completed by the SA and reviewed by the AT and team physician either through the MyUHS portal or directly through the AT and/or team physician.

Policy Title: Concussion Safety Protocol

- b. Post-Injury Hybrid NP Testing (e.g. ImPACT and paper/pencil tests) performed once symptom free and beginning moderate level of activity or as determined by team physician.
- c. Post-injury NP testing sent in encrypted format to outside consulting neuropsychologist along with clinical information by team physician. NP testing interpreted by outside consulting neuropsychologist and results communicated to SA by team physician.
- d. Return to limited academic and physical activities determined by the team physician, consistent with the most recent Concussion in Sport Guidelines (Patricios et al BJSM 2023) and American Medical Society for Sports Medicine Guidelines (Harmon et al BJSM 2019).
- e. Follow up with team physician once athlete is symptom free as well as when ready to return to full play, or weekly, whichever comes first as determined by team physician. If not seen by the team physician at these time points, the plan of progression must be discussed between the AT and team physician.

7. Return to Academics

- a. Avoid complete rest and isolation, even for an initial 24-48 hours.
- b. **Individualized and stepwise plan that may address environment, physical, curriculum and/or testing adjustment;** collaboration between team physician, Dean, Assistant Dean for Studies, the Assistant Dean of the College, the Academic-Athletic Advisor, and the Office of Disabilities as necessary.
- c. SA will reach out to the Assistant Dean of the College as well as their Assistant Dean for Studies to let them know that they were diagnosed with a concussion, copying the team physician to enhance communication regarding recovery.
- d. During check-ins with AT and team physician, continued monitoring of any symptoms, including their ability to attend class, their difficulties with performing homework should be addressed and monitored.
- e. Modification of class load as necessary, discussed between team physician and academic team, with input from others as necessary. Short term adjustments and extensions, as well as longer term adjustments and/or consultation with the Office of Disabilities, as necessary.
- f. Gradual increase in academic load until back into full academic activities. Return to learn and return to sport will often occur in parallel, with progressive cognitive and physical demands. Full return to academics should occur prior to full return to sport.
 - 1. Begin return to learn at home (i.e. reading, academic work); when tolerating 30-45 minutes of academic work, then return to class.
 - 2. Return to class; Choose class when least likely to be symptomatic and that does not interfere with sleep cycle.
 - 3. Increase return to class as able with academic support (i.e. extensions, notes, extended test time, frequent breaks) until attending full class schedule.
 - 4. Wean off academic support to full academic load.

8. Return to Sport Decisions.

- a. **Individualized decision made by the team physician.** Review of symptoms, neurocognitive and balance testing, and consultation from the athlete, AT, consulting neuropsychologist, and additional outside consultation as appropriate.

- b. **Time athlete held out of activity, rate of return to academics and sport progression are individualized with decision made by team physician.**
- c. Modifiers to consider:
 - i. Specifics of current injury (e.g. symptom burden, nature and duration, as well as results of post-injury neurocognitive / balance testing / other clinical exam findings)
 - ii. Age
 - iii. Prior history of concussion (#, specifics of prior injurie(s), severity of prior injurie(s), recency)
 - iv. Other possible “modifiers” (e.g. history of ADHD or Learning disabilities, Headaches or Migraine, Depression, Anxiety or other mental health disorder, or Seizure disorder)
 - v. Other (e.g. emotional readiness, academic demand / calendar, emotional disorders (e.g. depression or anxiety), parental concern)
- d. **Athletes should have an initial period (approximately 24-48 hours) of both relative physical rest and cognitive rest before beginning the return to sport progression; relative rest period includes activities of daily living and reduced screen time.**
- e. **After the initial period of relative rest, an athlete can return to light physical activity (i.e. walking or stationary cycling) that does not provoke or exacerbate symptoms as guided by the AT and team physician.** There may be situations where controlled cardiovascular (CV) exertion that does not exacerbate symptoms can be considered as part of treatment in non-acute settings. These exceptions are decided on by the team physician and are separate from the Return to Sport progression outlined below. An athlete with exacerbation of concussion signs and symptoms at rest or exertion should not continue to participate and should inform their AT or team physician.
- f. **Gradual progression in activity;** stepwise with gradual increments in physical exertion and risk of contact, consistent with most recent Concussion in Sport Guidelines (Patricios et al BJSM 2023)
 - 1. Symptom limited activity (daily activities that do not exacerbate symptoms)
 - 2. Aerobic exercise (2A-light/up to 55% max HR; 2B-moderate/up to 70% max HR) (15 – 20 minutes) intended to increase heart rate and break a sweat. May start light resistance training that does not result in more than mild and brief exacerbation of concussion symptoms.
 - o Mild is defined as an increase of no more than 2 points on a 0-10 point scale when compared with the pre-exercise resting value. Brief is defined as less than one hour.
 - 3. Individual sport-specific exercise- training away from team environment (i.e. running, change of direction and/or individual training drills). No activities at risk of head impact.

Proceed to Step 4 only after resolution of signs and symptoms related to the current concussion, including with and after physical exertion.

 - 4. Non-contact training drills (no contact activities). Exercise to high intensity including more challenging training drills.
 - 5. Full-contact practice (participate in normal practice without restrictions).
 - 6. Return to sport/full game play.

g. Rate of progression and final clearance is determined by the team physician.

- i. No return to contact until complete concussion symptom resolution, neurocognitive, balance, and other clinical testing (including hybrid NP testing) is considered normal and back to baseline function as interpreted by consulting neuropsychologist, and sport-specific progression is completed without recurrence of symptoms.
- ii. If NP testing interpreted as abnormal, repeat NP testing performed per recommendations of consulting neuropsychologist.

9. Clearance & Final Follow Up

- a. **Final clearance decision made by PUAM team physician.** Additional consultation and/or testing may be indicated and will be determined by the team physician.
- b. SA education regarding the importance of reporting all symptoms as well as increased risk for subsequent concussion.
- c. Repeat SCAT and NP testing (computerized and Paper & Pencil testing) for returning student athlete six months post injury to establish a new “baseline”.

10. Reducing Head Impact Exposure

Princeton is committed to protecting the health of and providing a safe environment for each of its participating NCAA student-athletes. To this end and in accordance with NCAA association-wide policy, Princeton will reduce student-athlete head impact exposure in a manner consistent with Interassociation Recommendations: Preventing Catastrophic Injury and Death in Collegiate Athletes. For example:

- a. Princeton teams will adhere to existing ethical standards in all practices and competitions.
- b. Using playing or protective equipment (including the helmet) as a weapon will be prohibited during all practices and competitions.
- c. Deliberately inflicting injury on another player will be prohibited in all practices and competitions.
- d. All playing and protective equipment (including helmets), as applicable, will meet relevant equipment safety standards and related certification requirements.
- e. Princeton will keep the head out of blocking and tackling in contact/collision, helmeted practices and competitions.
- f. Princeton will emphasize education of proper techniques to reduce head impact exposure for all contact and collision sports, with special emphasis in pre-season.
- g. Princeton will limit the number and duration of contact and collision in practices, intensity of contact in practices, and promote strategies restricting collision time in practices in contact-collision sports.
- h. Princeton will adhere to policy and rules in sport that reduce collisions.
- i. Consider participation in neuromuscular training warm-up programs.
- j. For ice hockey: it is recommended that all players wear a mouthguard.

Policy Title: Concussion Safety Protocol

REFERENCES:

- Patricios JS, Schneider KJ, Dvorak J, *et al* Consensus statement on concussion in sport: the 6th International Conference on Concussion in Sport–Amsterdam, October 2022 *British Journal of Sports Medicine* 2023;**57**:695-711.
- Sport Concussion Assessment Tool 6 (SCAT6) *British Journal of Sports Medicine* 2023;**57**:622-631
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- [Concussion Safety Protocol Management - NCAA.org](https://www.ncaa.org/sport-science-institute/concussion-safety-protocol-management)