

SUBJECT:	Head Injury and Concussion Management Plan	EFFECTIVE DATE:	May 2011		
		REVISED DATE:	March 2017		
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Overview

The USC Athletics Head Injury Program & Concussion Management Plan was developed and updated as a result of careful discussions regarding relevant research, areas of prevention, recognizing emergent situations, selecting appropriate testing methods, identifying the optimal processes of following the athlete post-concussion, and determining when it is safe to return. The USC Athletics Head Injury Program & Concussion Management Plan is evaluated and discussed each year at the USC Athletic Medicine Meeting. It is a program that we continually assess and update.

USC Athletic Medicine is overseen by a lead physician who jointly reports to the athletic director and a designee of the provost and senior vice president for academic affairs with appropriate medical expertise and authority. For many years, USC Athletic Medicine has employed a comprehensive, multidisciplinary approach to head injuries, including concussions. The Head Injury Program and Concussion Management Plan is overseen by the lead Athletic Department neurosurgeon, who maintains a contemporary global perspective regarding his discipline and expertise in brain and spinal injuries and other events involving neurological deficit, as well as historical knowledge of the sports teams, personnel, and student-athletes. USC Athletic Medicine operates with a team approach that is based on mutual respect among team physicians and staff athletic trainers and where excellent communication is expected to best serve the student-athlete. To this end, team physicians and staff athletic trainers receive continuing education related to concussions and other head injuries by attending conferences, and they educate coaching staff on the identification and management of suspected concussions. Team physicians and staff athletic trainers also maintain open and direct communication with the university administration and team coaches.

Awareness and Education

Each year, all student-athletes must receive awareness education regarding the signs and symptoms of concussions. Student-athletes must acknowledge that they have received the information about the signs and symptoms of concussions, and that they have a responsibility to report such signs and symptoms and concussion-related injuries and illnesses to the USC Athletic Medicine Staff. The signed acknowledgements are filed in the student-athlete's medical chart. Parents of student-athletes will also be provided with head injury awareness education upon request.

Student-athletes are informed that basketball, football, lacrosse, soccer, volleyball, baseball, diving, pole vault, and water polo (the Contact Sports) have been identified as sports with an increased potential for head injury. Baseline data collections, injury evaluations, and return-to-

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play guidelines, as explained in further detail below, are now required for each student-athlete all sports.

Team physicians, staff athletic trainers, coaches and athletic directors are educated about concussions by policy review, an educational video about the signs and symptoms of concussion and are given NCAA Concussion Handouts. They must acknowledge they have received and reviewed the educational information and that they understand their role within the policy. The acknowledgements are documented and maintained within the athletic department.

Prevention

In the area of head injury prevention, equipment and style of play are factors that require special consideration. The USC Athletic Equipment Staff play a very important role in the fit and selection of football helmets. The team Neurosurgeon assists the athletic equipment staff in selecting and approving the model of helmets for football.

Coaches also play a pivotal role in educating and training players to use proper techniques to reduce the risk of injuries, and are required to instruct players in techniques that reduce the risk of concussion when appropriate. In football, coaching staff teach proper tackling and blocking techniques and endeavor, to the extent practicable and reasonable, to conduct less hitting practices than currently allowed by the NCAA. In July of 2013, the PAC 12 Conference initiated a reduction in contact practices in football. USC adheres to these regulations.

Reducing Exposure to Head Trauma

USC Athletics follows the PAC 12 Practice Guidelines for Football.

USC Athletics adheres to its Independent Medical Care for Student-Athletes Best Practices Document.

USC Athletic Medicine takes a “safety-first” approach to caring for student-athletes.

The USC Concussion Education emphasizes a safe style of play that utilizes proper technique that is within the rules for coaches and student-athletes.

Pre-participation Physical Examination (PPE)

Each student-athlete must undergo a pre-participation physical examination conducted by a team physician. In that examination, the physician will review the student-athlete’s previous history of concussion or head injury and evaluate for any signs or symptoms. The team physician will determine final clearance to participate. Staff athletic trainers are responsible for coordinating baseline data collection that includes symptoms, cognitive assessment and balance evaluation prior to the first contact practice.

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Baseline Data Collection

Part of our comprehensive program involves collection of baseline data. Currently, USC collects data from the Standard Assessment of Concussion (SAC), Post Concussion Symptom Scale (PCSS), Balance Error Scoring System (BESS) and a computerized psychometric program called ImpACT (Immediate Post-Concussion Assessment and Cognitive Testing). The baseline SAC, PCSS, and BESS are stored and are accessible in a secure cloud. The baseline ImpACT is collected on a computer via a secure website and may be viewed and/or downloaded into a PDF file. The assigned staff athletic trainer is responsible for coordinating baseline data collection for their sport. Baseline data must be collected for each student-athlete prior to their first contact practice.

Evaluation of Head Injury Sideline Evaluation

Staff athletic trainers, and sometimes team physicians, who are trained in the diagnosis, treatment and initial management of acute concussions are present at all NCAA varsity competitions and are available at NCAA varsity practices for the following contact/collision sports at USC: baseball, basketball, diving, football, lacrosse, pole vault, soccer, volleyball, and water polo. To be available means that, at a minimum, medical personnel can be contacted at any time during the practice via telephone, messaging, email or other immediate communication means. Further, the case can be discussed through such communication and immediate arrangements can be made for the student-athlete to be evaluated. Immediately after a suspected head injury, a student-athlete will be removed from athletic activities and given a careful evaluation by a USC athletic medicine staff member with experience in the evaluation and management of concussions, which may include a staff athletic trainer, team physician, or neurosurgeon. Coaches shall defer to the USC athletic medicine staff member's decision to remove a student-athlete from practice or competition. Coaches also have a responsibility to report any suspected head injuries to the appropriate USC athletic medicine staff for an immediate assessment. This assessment will be conducted by a neurosurgeon when present. A team neurosurgeon will be on the sideline at every football game, whether home or away.

A general physical assessment will be conducted, including an evaluation of memory, concentration, motor-function (both general and specific), balance/coordination, and cranial nerve function. A thorough history will be taken that includes questions about common concussion symptoms as well as a previous history of concussion. The athletic medical staff will be furnished with iPads for each game, which will contain each student-athlete's concussion history and baseline test data, as well as a sideline assessment tool. The iPad data shall be updated regularly as needed by the athletic training staff. The sideline assessment tool represents a standardized method of evaluating student-athletes for concussion. It is not a substitute for the clinical judgment of the team neurosurgeon, which remains a key element in diagnosing head injuries.

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Any student-athlete who exhibits signs, symptoms or behaviors consistent with a concussion will be removed from athletic activities (e.g., competition, practice, conditioning sessions) and evaluated by a medical staff member (e.g., sports medicine staff, team physician or neurosurgeon) with experience in the evaluation and management of concussions. Student-athletes exhibiting signs, symptoms or behaviors consistent with a concussion may not return until authorized to do so by a physician with experience in the evaluation and management of concussions.

Any student-athlete who is diagnosed with a concussion or sustains a loss of consciousness will not return to athletic activity or class that day. Oral and/or written instructions will be given to the student-athlete and/or responsible adult on the signs and symptoms to watch out for and the need to follow up the next day. These instructions will be documented into the student-athlete's chart. Any student-athlete who has a progression of symptoms, signs or function will be hospitalized immediately for further evaluation with notification to the team neurosurgeon.

In addition to evaluating for concussion, the physician/athletic trainer will evaluate the student-athlete for skull fracture, intracranial bleed and possible cervical spine injury. If there is a suspected skull fracture, intracranial bleed or possible cervical spine injury, the student-athlete will be sent to the hospital for further evaluation. Other indications for further medical care would also include situations where the Glasgow Coma Scale <13, prolonged loss of consciousness, focal neurological deficit suggesting intracranial trauma, repetitive emesis, persistently diminished/worsening mental status or other neurological signs/symptoms or suspected spine injury. The Emergency Action Plan will be followed depending on the circumstances but may include activation of Emergency Medical Services for transport, spine boarding with removal of football facemask (possibly the helmet/shoulder pads), CPR, AED or First Aid as necessary.

Follow-Up Evaluation

The recovery and progress of any student-athlete diagnosed with a concussion or exhibiting signs, symptoms or behaviors consistent with a concussion will be followed by the staff athletic trainers. The student-athlete will be evaluated serially throughout the process, including through continued historical and physical assessment, and by conducting SAC, PCSS, and/or BESS tests. The results of these tests will be documented in the student-athlete's chart and communicated to the team physician and/or neurosurgeon.

Generally, once asymptomatic and the SAC, PCSS, and/or BESS tests are measured at baseline levels while at rest, the student-athlete will be exerted under the guidance and observation of a staff athletic trainer. Whenever possible, exertion will follow a progression from light aerobic exercise without resistance, to resistance training, to sport specific exercise without contact, unrestricted training and return to competition. Clinical judgment will be used to determine the exercise progression. If the student-athlete remains asymptomatic after exertion, ImPACT will be administered. Post-injury ImPACT test results are compared to

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baseline data and are evaluated by the neuropsychologist. The staff athletic trainer communicates all information to a team neurosurgeon.

If a student-athlete has a prolonged recovery (>2 weeks), they will be referred to a team neurosurgeon for further evaluation. Careful consideration will be given for possible post-concussion syndrome, sleep dysfunction, migraine or headache disorders, mood disorders or ocular/vestibular dysfunction. The team neurosurgeon will determine the best management options.

Return to Learn

USC Athletics has a multidisciplinary approach to return to learn for student-athletes who sustain a concussion. This approach is ADAAA compliant. USC Athletics Academic Services has counselors, learning specialists and tutors to assist student-athletes with academics. They may facilitate communication with the course instructors. USC Athletics also utilizes clinical psychologists and neuropsychologists who may assist as well with those student-athletes in need of those services.

- The Director of the Academic Services, or their designee, will follow the progression of the concussed student-athlete with light cognitive activity until a there is a fully integrated return to learn.
- The student-athlete will be permitted to remain at home/dorm if they cannot tolerate light cognitive activity.
- Once the student-athlete’s symptoms normalize, a gradual return to attending classes and studying will be permitted, as long as this is tolerated well by the student-athlete.
- There may be no classroom activity on the same day of a diagnosed concussion.
- The student-athlete will be continually evaluated by the athletic medicine staff, so if symptoms worsen, this will be communicated to the team neurosurgeon and the academic plan will be adjusted accordingly.

Return to Play

Clinical judgment remains a key element of making return to play decisions. The health and welfare of the student-athlete is the priority when determining when it is safe for the student-athlete to return to play. Return to play decisions are based on the body of evidence suggesting injury resolution, the truthfulness of the student- athlete and the clinical judgment of the physicians and staff athletic trainers. Involvement of knowledgeable neurological and neurosurgical specialists, who are integral to the program, its development and evolution, is an essential feature of the USC composite of care and evaluation of neurological injury. Return to

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play decisions for student-athletes, while within the clinical judgment of the medical professional, must nonetheless be consistent with the below:

- Any student-athlete who exhibits signs, symptoms or behaviors consistent with a concussion will be held out of athletic activities until authorized to return by a physician with experience in the evaluation and management of concussions.
- Any student-athlete who is diagnosed with a concussion or sustains a loss of consciousness will not attend class or return to athletic activity that day.
- Any student-athlete who is diagnosed with a concussion is not permitted to exercise while symptomatic.
- Any student-athlete who is diagnosed with a concussion may not return to athletic activity until authorized to return by a physician with experience in the evaluation and management of concussions after that physician determines that the student-athlete meets each of the below USC Return to Play Guidelines, which must be followed in all cases:
 - o Asymptomatic at rest and after exertion
 - o Return to baseline tests (SAC, PCSS, and/or BESS);
 - o ImPACT data reviewed by neuropsychologist for evaluation; and
 - o Final decision made with clinical judgment