

#### 4.3.a Concussion Education, Management, and Return to Daily Activity

##### **Purpose:**

The purpose of these guidelines is to identify a standard procedure to be used for the identification and management of sport and non-sport related concussion for varsity student-athletes at Stanford University. This includes the education of key stakeholders, as well as educational recommendations to be considered by the Stanford Office of Accessible Education (OAE), the Department of Athletics, Physical Education and Recreation (DAPER), and University faculty. These guidelines comply with the 2015 NCAA Concussion Safety Protocol Checklist and apply the best-known evidence-based methods to ensure optimal health and performance of Stanford varsity student-athletes.

##### ***Understanding Concussion***

Concussion is an undefined condition, however recent efforts have been made to better understand concussion diagnosis and treatment by agreeing on a universal, evidence-based definition. In 2014, concussion was described and adopted by the NCAA as being associated with:

- A change in brain function
- following a force to the head
- that may be accompanied by temporary loss of consciousness
- is identified in awake individuals, and
- includes measures of neurologic and cognitive dysfunction

##### **Concussion Management Plan**

The most important components of a successful Concussion Management Plan are those designed to educate, promote early reporting, and support objective detection. Due to the lack of evidence base supporting diagnosis and ideal management strategies, clinicians have been largely reliant on subjective reporting. However, it is the responsibility of the Sports Medicine staff to use objective diagnostic tools to properly diagnose, treat, and implement recovery methods. This management plan is outlined here:

##### ***Required Concussion Education***

On an annual basis, the following steps will be taken to promote and educate:

1. Student-athletes will receive NCAA approved education materials about concussion and will document their acceptance of responsibility for reporting their injuries and illness to the Stanford University Sports Medicine staff, including signs and symptoms of concussion (Appendix B).
2. DAPER Athletic administrators, coaches, and medical personnel at Stanford University will also receive NCAA approved educational materials about concussion and will document their understanding of this plan (Appendix B).
3. Football coaches understand and abide by the Year-Round Football Practice Contact Guidelines established by the Pac-12 Conference.

##### ***Baseline Concussion Testing***

All student-athletes will be required to complete baseline testing, which will most often occur at the time of the Pre-Participation Evaluation (PPE). During this time, brain injury risk and concussion history will be reviewed via the completed Health History Questionnaire (Form A) collected as part of the ePPE. Per Sports Medicine policy, only a Stanford Team Physician will be able to grant medical clearance as part of the PPE process. Currently, Stanford University Sports Medicine employs two baseline-testing tools:

1. Integrated Concussion Evaluation (ICE): a SCAT3 (Standardized Concussion Assessment Tool) compliant, tablet-based software application created by X2 Biosystems (Seattle, WA). All concussion baseline testing, post injury assessments, and return to sport progressions are captured using this secure, cloud based system. These data are then replicated into the student-athlete Electronic Medical Record (EMR).
2. EYE-SYNC: a commercial eye tracking device that objectively measures eye performance, created by Sync Think, Inc. (Boston, MA). This device monitors cognitive impairments through use of the predictive timing element of oculomotor function. All baseline testing and post injury assessments will be captured on this system, and will also be employed to assess recovery.

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##### ***Concussive Event***

Student-athletes who exhibit signs and/or symptoms of a concussion will be removed from participation in practice or competition and evaluated by an informed member of the Stanford University Sports Medicine staff. Any student-athlete suspected of sustaining a concussive injury WILL NOT return to play on the same day of injury and will be medically assessed and monitored for deterioration. The student-athlete should be clinically evaluated by a team physician immediately following completion of post injury assessment testing or within 24 hours, whichever is soonest and feasibly possible given the circumstances of each case. In cases of confirmed concussion diagnosis, written management recommendations will be provided to the student-athlete, roommate, and others as necessary for at home care (Appendix B).

In some cases, signs and symptoms may warrant a prioritization in care. Under these circumstances, appropriate medical care will be delivered in a timely manner, and the student-athlete's disposition will continue to be followed under the supervision of a team physician. Should any of the following be identified upon examination or monitoring, refer to the specific athletic venue Emergency Action Plan for immediate transfer to the Emergency Department:

- Glasgow Coma Scale <13
- Prolonged loss of consciousness (>1 minute)
- Focal neurological deficit suggesting intracranial trauma
- Repetitive emesis
- Persistently diminished/worsening mental status or other neurological signs/symptoms
- Spine Injury

The team physician may also choose to make timely referrals for immediate treatment and further evaluation. After the initial evaluation, the team physician may consult the Stanford Concussion and Brain Performance Center for further testing, evaluation, and management recommendations. Additionally, in cases of confirmed vestibular dysfunction, the team physician may refer student-athletes to physical therapy/athletic training to begin rehabilitation immediately. In cases where recovery is slowed (unresolved deficits greater than 2 weeks), additional referrals for neuropsychological testing, neurological evaluation, and brain imaging may be warranted. However, the team physician remains the only medical professional who can clear the student-athlete to resume prior activity levels.

##### ***Management of Concussion in the Absence of an Athletic Trainer***

In the event that a team is off-campus without an athletic trainer and a student-athlete is suspected of having sustained a concussion, the student-athlete will be withheld from practice and/or competition until the team physician has evaluated them. This procedure will also be utilized when student-athletes sustain a concussion not related to sports participation.

##### **Use of Neuromotor Analytics in the Return to Activities of Daily Living**

It is important to understand that concussion is not just a sport related injury, it is a disruption of daily life for many student athletes. Simple tasks that require attention focus such as reading, operating a computer, riding a bicycle, or driving a car may be impaired after a concussive event. Additionally, academic routines may be temporarily compromised until the treatment plan has been established and recovery has begun. As a result, those providing care for the injured student-athlete may impose specific limitations to these activities. It is a goal of the medical staff to develop a specific plan that meets the needs of each individual student-athlete.

With regard to academic considerations, a multi-disciplinary team of Sports Medicine staff (consisting of team physicians, neurologists, athletic trainers and/or physical therapists as appropriate), the AARC staff led by the Assistant Athletic Director for Student-Athlete Advising & Development, the FAR and OAE staff will communicate their recommendations for accommodations to the University faculty and student-athlete. This academic care team will rely on the recommendations of the Sports Medicine staff, on a case-by-case basis. Student-athletes who have an inability to focus after a concussion are at risk for poor academic performance and will need individualized academic advice to make the transition to full recovery. In compliance with the Americans with Disabilities

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Amendments Act (ADAAA), and in order to limit cognitive stressors and support recovery during this period, reasonable accommodations will be made to ensure continued academic progress.

#### **Stepwise Progression**

In cases of suspected concussion, student-athletes will be withheld from classroom activity on the same day of injury, in accordance with NCAA guidelines. If objective measures demonstrate clear variance from prior baseline tests, indicating a concussion, student-athletes will be withheld from daily activities that require attention, focus, and concentration until it is objectively clear that recovery has occurred. At times, this may occur on the next day. In cases of attention focus with no objective variance from baseline, contact sport student-athletes will still be required to complete a stepwise progression of physical exertion. However, non-contact student-athletes may be cleared to return to sport immediately without the completion of a stepwise progression. A sample progression of daily and physical activities may involve the following:

Post Injury	Daily Activity	Physical Exertion
Day One	Cognitive rest; 10-15 minute bouts reading, writing, cell phone	Moderate Intensity Exertion
Day Two	Resume limited driving, biking, studying	Modified Weight Lifting
Day Three	Increased daily activities, resume normal classroom attendance	On Field/Court Physical Conditioning
Day Four	Normal daily activities, resume homework/tests	Non Contact Practice
Day Five	Resume normal academic routine	Normal Full Practice

#### **Continuation of Care**

As recovery continues, modifications and/or additional steps may be required to complete the progression, depending on the academic and sport demands of the student-athlete. It is the responsibility of the Sports Medicine staff to appreciate these nuances and adjust progressions accordingly for each student-athlete. Ultimate return to normal academic routines, as well as return to play will only occur after completion of progression(s), and the team physician has granted final clearance.

#### **References**

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