

Concussion Management: Student Athlete and Institution Protection

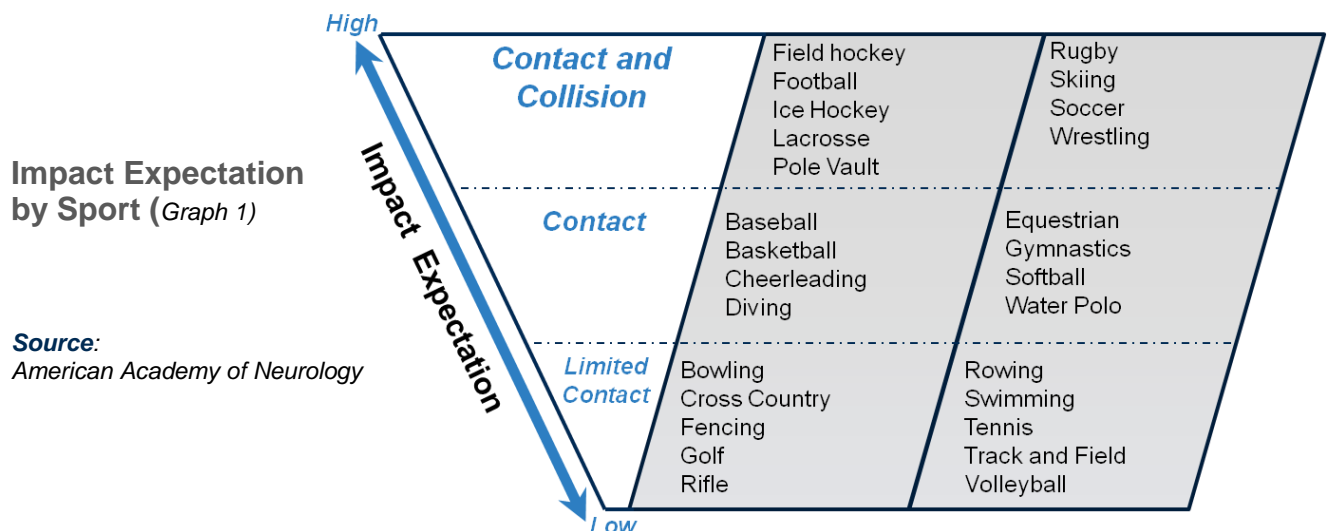
Scientific and clinical evidence is beginning to shed light on potential long-term effects student athletes sustain after a concussion. Culturally, however, questions remain about the response by coaching staff and student athletes. Are coaches, student athletes, and institutions more concerned with winning and the institutional image over player health and well-being? If so, the liability exposure to an institution dramatically increases without proper protocols, controls, education, documentation, and a medical evaluation plan. Additionally, institutions need to look beyond sanctioned sports programs and explore if concussion management controls are practiced for club sports and school-sponsored athletic camps.

Definition

What is a concussion? Also known as mild traumatic brain injury (mTBI), it's defined as a complex pathophysiological process affecting the brain, induced by biomechanical forces (Zurich 2012). In layman's terms, a concussion is a brain injury caused by a direct blow to the head or neck or a strike to other portions of the body that is transmitted to the head. This sudden movement causes the brain to bounce or twist within the skull, damaging brain cells and creating chemical changes in the brain.

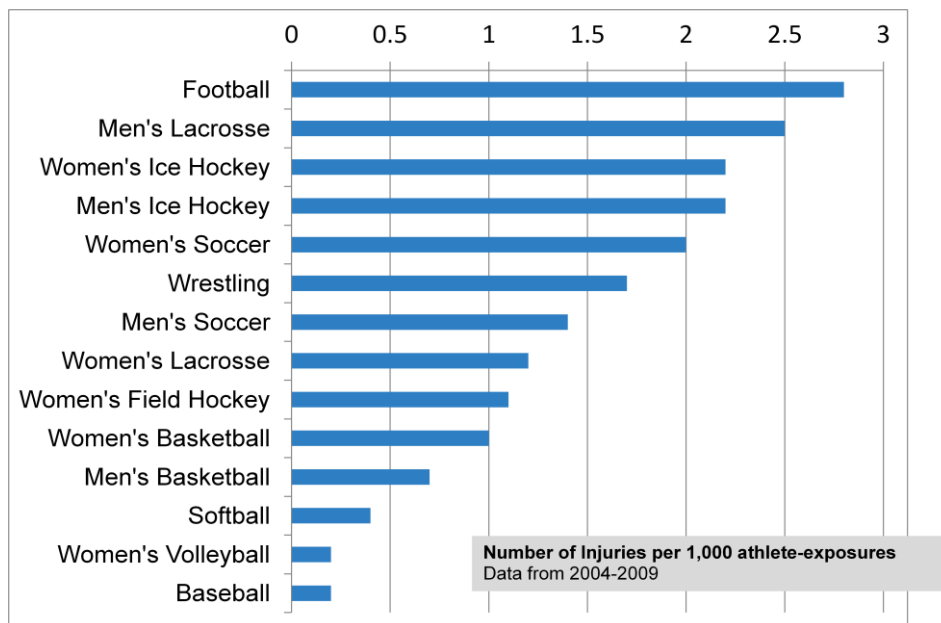
Impact Analysis and Statistical Breakdown by Sport

Concussion incident rates differ among the varying sports and contact/collision exposure. To better characterize the contact and collision risk, the American Academy of Neurology describes collision and contact sports as those in which, "athletes purposely hit other athletes or inanimate objects." This classification provides specific insight into which sports pose the greatest concussion potential and impact probability (Graph 1).



Based on impact exposure, the NCAA performed a frequency rate analysis of 14 varsity sports. They looked at the frequency rates from two different angles – incidence during competition (Graph 2) and percentage of concussions from each sport based on the total number of concussions that occurred during practice and competition (Graph 3).

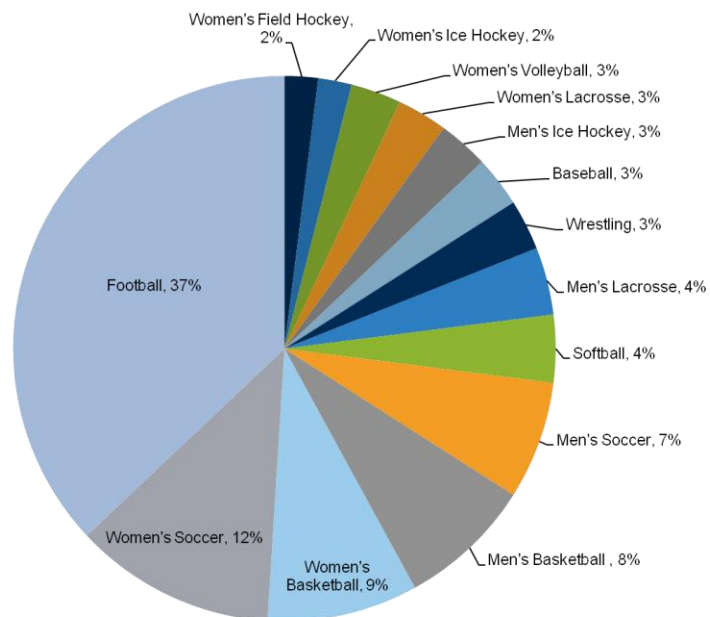
Rate of Competition Concussion Injury in 14 NCAA Sports (Graph 2)



National Annual Estimate of Concussion for Practice and Competition in 14 NCAA Sports (Graph 3)

Data from 2004-2009

Source:
2013-14 NCAA Sports Medicine Handbook



Baseline Testing

The first step of concussion management is implementing a pre-participation baseline testing program for student athletes. The baseline assessment should include a questionnaire about previous medical history/prior concussion(s) sustained, the use of a symptoms checklist, and standardized cognitive and balance assessments. The Sports Concussion Assessment Tool (SCAT) 2 and 3 combine these variables into one test. The same assessment tool should be utilized post-injury to compare the results based on neurological function. At a minimum, baseline testing should be performed on these sports (due to impact and concussion probability):

- Baseball
- Football
- Rugby
- Field Hockey
- Pole Vaulting
- Wrestling
- Basketball
- Gymnastics
- Soccer
- Equestrian
- Lacrosse
- Water Polo
- Diving
- Ice Hockey
- Softball

Signs and Symptoms

Concussions are not a static experience, but rather a process that may develop and evolve over minutes, hours, days, and weeks. Since there is no uniform definition of concussion, no definitive neuroimaging classification criteria, and varying symptoms exhibited by student athletes, it is imperative to be knowledgeable in the identification of the clinical signs and symptoms:

Student Athlete Symptoms:

- Nausea
- Dizziness or balance problems
- Blurry vision
- Headache
- Amnesia
- Loss of consciousness
- Confusion
- Sensitivity to light or noise
- Drowsiness

Signs Observed by Coaching Staff or Athletic Healthcare Provider:

- Forgets plays
- Is unsure of game, score or competitor
- Answers questions slowly
- Appears stunned or dazed
- Confusion with position or assignment
- Responds to questions slowly
- Exhibits behavior changes
- Can't recall events before and/or after hit or fall
- Moves clumsily

Concussion Management

If a student athlete is suspected of having a concussion, he/she should be evaluated immediately on the field or sideline by medical staff. The initial assessment should include a review of the airway, breathing, and circulation (ABCs), then progress to an evaluation of the cervical spine and skull for an associated injury. Once the physical survey is complete, the medical provider should assess the student athlete's cognitive and balance abilities using the same baseline testing protocol. A plan of action should be developed to care for the student athlete if his/her assessment reveals a potential concussion; the plan may include further clinical evaluation by a healthcare professional, admission to a hospital, and ensuring the individual is not left alone for a specified period of time. A roommate or team member and the concussed student athlete should be provided with written instructions on the importance of:

- Avoiding alcohol and drugs, which increases cognitive impairment
- Avoiding aspirin or other medications that could increase the risk of bleeding
- Contacting medical personnel if the individual exhibits the following signs:
 - Worsening headache
 - Dilated pupils
 - Stumbling
 - Increased confusion and irritability
 - Vomiting
 - Decreased levels of consciousness

Cognitive and Physical Rest

Recovery time differs based on severity and individual factors, but in many situations the chemical imbalance in the brain is restored within 7-10 days; however, this doesn't necessarily mean the individual can return to active participation. During the recovery phase, individuals should get plenty of physical and cognitive rest. This may require the student athlete to significantly, but usually temporarily, scale back studying, class attendance, video games, computer use, and homework. If the healthcare professional recommends this course of action, the institution may need to request permission to share medical status with the student's professors and academic advisors to determine the need for a provisionally abbreviated class schedule/workload.

It's important to note that the effects of a concussion are cumulative, meaning that student athletes that return to action prior to recovery suffer more severe symptoms of longer duration. Studies also indicate that after sustaining an initial concussion, the athlete's sensitivity increases and impact severity decreases, thus resulting in the potential for additional concussions. Consequently, the mandate for adequate physical and cognitive rest is vital.

Return to Action

Most athletes observing competition from the sideline while recovering from an injury have an urge to get back into action as quickly as possible. Returning to play following a concussion drastically differs from returning after a bone fracture, and it's important to follow progressive

rehabilitation steps (Table 1) in addition to receiving official, written medical clearance from the healthcare professional.

Graduated Return-To-Play Protocol

(Table 1)

| Rehabilitation Stage | Functional Exercise at Each Stage of Rehabilitation | Objective of Each Stage |
|--------------------------------------|---|---|
| 1. No activity | Symptom-limited physical and cognitive rest. | Recovery |
| 2. Light aerobic exercise | Walking, swimming or stationary cycling keeping intensity less than 70 percent maximum permitted heart rate. No resistance training. | Increase heart rate |
| 3. Sport-specific exercise | Skating drills in ice hockey, running drills in soccer. No head-impact activities. | Add movement |
| 4. Noncontact training drills | Progression to more complex training drills, e.g. passing drills in football and ice hockey. May start progressive resistance training. | Exercise, coordination and cognitive load |
| 5. Full-contact practice | Following medical clearance, participate in normal training activities. | Restore confidence and assess functional skills by coaching staff |
| 6. Return to play | Normal game play | |

Source: 2013 International Conference on Concussion in Sports, Zurich, Switzerland

Documentation and Education

Properly diagnosing a concussion can be best influenced by having a comprehensive concussion management plan that the athletic training staff and student athletes fully understand and adhere to, which includes annual education and signed acknowledgement documentation. Clearly defined roles, responsibilities, and expectations are key to raising awareness among all levels of athletics' programs and ensuring all coaches, trainers and student athletes are accountable for practicing the concussion management plan.

Documents/acknowledgement forms that should be filed:

- Attendance record of all parties receiving concussion management education
- Coach and student athlete acknowledgement form – affirming that he/she understands the concussion management plan and agrees to adhere to the protocols set forth (including self reporting for student athletes and coaches agreeing to follow the recommendations medical professionals establish for the concussed individual)
- Athletic program healthcare provider acknowledgement form – affirming that he/she understands the concussion management plan and their role to make the ultimate decision on removal and return to action for student athletes
- Hold harmless waiver – signed by the student athlete specifying the risk of participation, agreeing to self report, etc. (waiver should be reviewed and approved by legal counsel)

- Documentation of steps taken to treat a suspected or confirmed concussion include: causation, assessment, provided care and management, and authorization to return to play

Annual education for coaches and student athletes regarding the institution's concussion management plan should include:

- Significance of baseline testing
- Potential impacts to a student athlete after receiving a concussion (academically and athletically)
- Review of the signs and symptoms of a concussion
- Importance of swiftly reporting concussion signs and symptoms to healthcare staff
- Requirements for physical and cognitive rest
- Review of the progressive rehabilitation steps for returning to action

Best Practice Takeaways for a Concussion Management Plan

1. Ensure a documented concussion management plan is fully implemented.
2. Educate student athletes and coaches on the concussion management plan every year; include: NCAA compliance-related material, plan changes or enhancements, and roles and responsibilities. Also include student athlete expectations for safe play, emphasizing the significance of properly maintaining and wearing personal protective equipment. Capture attendance records, acknowledgement/waiver forms, and provide handout material (e.g. signs and symptoms checklist) to student athletes/coaches at the conclusion of the training.
3. Perform baseline testing using SCAT 2 or 3 protocols on the sport participants listed in the section titled "Baseline Testing."
4. Document and annually update an emergency action plan for each athletics venue that accounts for catastrophic injuries sustained by student athletes. Periodically practice the plan with athletic healthcare providers, coaching staff, and emergency responders.
5. Ensure a process exists for the removal of a student athlete, from practice or competition, who demonstrates signs or symptoms consistent with a concussion. Document the cause of injury, initial evaluation findings and follow-up care and management.
6. Obtain clearance documentation from an authorized medical professional validating the student athlete is asymptomatic.
7. Establish a systematic procedure that gradually reintroduces physical and cognitive activity.
8. Maintain on file an appropriate healthcare plan that includes equitable access to athletics medical care providers for each sport.

Institutional Risk

Club Sports and Athletic Camps

Many institutions “market” their expansive club sports program as an appealing feature to prospective students. That said, increased club team membership comes with greater liability risk to the institution if quality controls aren’t applied. The NCAA mandates that all divisions have in place a written concussion management program for varsity sports – although not applicable to club sports. You must consider what level of concussion-specific protection, resources and education your institution is providing to club teams. Club sports teams typically appoint a liaison or team president to manage the squad; this designated student should, at a minimum, receive educational resources about the signs and symptoms of concussions that he/she agrees to review with his/her teammates. This should also be coupled with training on the importance of self reporting, as healthcare oversight isn’t as readily available for club teams, and a signed waiver indicating that the club athlete assumes risk of participation and releases the institution from responsibility of injury (as reviewed and approved by legal counsel).

School-sponsored summer athletic camps are also common venues for team coaches to further promote their institution and team. In some cases, coaches actively engage volunteer coaches to assist with the program; these individuals should also be well versed in identifying the signs and symptoms of a concussed athlete as well as the institution’s concussion management protocols. Therein lies potential risk to the institution, especially as parental/public knowledge and awareness continues to grow around concussion management. A few key questions to consider for campers and athletes:

- Is healthcare staff available to assist in the evaluation of a potentially concussed camper?
- Does the institution’s emergency action plan account for severe injuries sustained during camps?
- Is there a protocol in place for notifying a parent or legal guardian about a potential concussion?
- If the camp requires an overnight stay:
 - Is there a process established for parental pickup if the camper sustains a concussion?
 - Does a process/self-reporting policy exist if a camper/athlete exhibits concussion signs and symptoms once the camp concludes for the day, but while still on campus?

Culture Modification

Hopefully, the cultural shift has begun to take place within your institution – where coaches and athletic healthcare staff put the well-being of your student athletes ahead of winning. This cultural shift must also occur within the student athlete population, as self reporting is critical to concussion identification and is an essential element of a successful concussion management plan.

Conclusion

As an institution, are you confident your concussion management plan meets or exceeds best practices to ensure the culture change is seamless for all athletic program members? An institution's liability exposures and reputational risks lie within the hands of your athletics department leadership and require them to ensure concussion management plan best practices are integrated into sporting events, competition and practice, and that all participants are educated on the importance of the plan.

References and Resources

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For More Information

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