CONCUSSION MANAGEMENT

Revision Date: October 23, 2012
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INTRODUCTION/PURPOSE:

Concussion management in sport is challenged by the fact that concussion risk is both individualized and dynamic. A blow to the head with the exact same forces will yield different symptoms of differing severity depending on the individual concussed. Add to this the fact that the brain is dynamic, especially in the developmental years of youth and adolescence, and is influenced by a multitude of other factors (i.e. sleep deprivation, dehydration, fatigue, depression, ADD/ADHD, headache disorders, drugs and supplements to name a few).

International experts have convened at conferences on three occasions, most recently in Zurich in 2008, in attempts to form consensus statements on the management of sports-related concussion. What has resulted is a recommendation to abandon the concept of categorizing concussions by "grades" or labeling them as "simple" or "complex" based on signs, symptoms, and severity at presentation for the purpose of making return-to-play decisions. This supports the realization that sports concussion diagnosis and management needs to be individualized, and does not lend itself to a "cookbook" approach.

The University of Michigan Athletic Medicine Staff recognizes that concussions are potentially very serious injuries that require a comprehensive and carefully measured approach to management. This policy was created with the understanding that each concussion, as well as each student-athlete, is unique. Individualizing concussion management, considering each student-athlete's complete medical history, and close physician involvement, are the hallmarks of this concussion policy, and are essential for the safety of our student athletes.

DEFINITION:

Concussion is defined as a complex pathophysiological process affecting the brain and induced by traumatic biomechanical forces. It is most commonly characterized by the rapid onset of a constellation of symptoms or cognitive impairment that is self-limited and resolves spontaneously.

BASELINE ASSESSMENT:

A pre-participation assessment for every student-athlete should include a detailed history and a brief neurologic assessment. This history should include details of prior concussions suffered before college entry and any history of migraine/headache disorders, ADD/ADHD, or other learning disabilities.

For student-athletes in sports deemed higher-risk for concussion (based on NCAA/Big Ten/Institution injury surveillance data), the pre-participation assessment also should include a more detailed baseline assessment of the student-athlete's neurological function using more objective techniques.

The higher risk sports include baseball, basketball, cheerleading, diving, field hockey, football, gymnastics, ice hockey, lacrosse, pole vaulting, soccer, softball, water polo, and wrestling. A baseline Michigan Sideline Assessment of Concussion (MSAC) and a computer neuropsychological test (Axon) will be obtained on student-athletes participating in these sports.

CONCUSSION EVALUATION:

When a student-athlete exhibits signs or symptoms that raise a concern for concussion, that student-athlete should be removed from participation and undergo evaluation by the athletic medicine staff (Certified Athletic Trainer (ATC) or Team Physician). Common signs and symptoms of Concussion are shown in Table 1. Many of these signs and symptoms often resolve spontaneously, and may or may not be associated with any loss of consciousness (LOC).

The immediate evaluation of the concussed athlete should include an assessment of the athlete's neurologic status. This should include some brief test to assess neurocognitive function, mainly memory and attention. An approximate timeline of the injury and the presence and severity of symptoms should be documented. The MSAC is one tool encouraged to be used to help in this initial assessment.

RETURN TO PLAY:

If the student-athlete is diagnosed with a concussion, that student-athlete is removed from competition and must not return-to play that same day. The student-athlete will have serial monitoring and if stable, be provided with verbal and written instructions at the time of discharge from that episode, preferably with a companion. If the student-athlete manifests signs and symptoms that are initially severe or their clinical status is deteriorating, that student-athlete may be referred to an emergency department for more immediate follow-up care.

Any future return-to-play decision is based on both the initial evaluation and subsequent follow-up assessments with a team physician, and is not entertained until the student-athlete is completely free of symptoms and has successfully progressed through graded exercise challenges without a return of symptoms. This progression typically starts with an initial exertional challenge such as biking or jogging for 15-20 minutes, with gradual and steady increases in exertion if the athlete remains without symptoms.

More sport-specific activities are then introduced limiting risk of contact before full return to sport without limitations. This progression can take anywhere from days to weeks and the speed with which the athlete moves through this progression and returns-to-play is dependent on multiple factors and is guided by the team physician.

Some of these factors include the clinical signs and symptoms, prior concussion history (number, remoteness, and severity), age, sport, position, and the athlete's lack of hesitancy to return. It is essential that the athlete is asymptomatic before any return-to-play progression is initiated.

In addition, when follow-up computerized neuropsychological testing is felt warranted by the treating team physician and is included as part of the post-concussion evaluation, the testing results should indicate a return to the student-athlete's baseline level of function before return to play. Of note, although computerized neuropsychological testing is promoted to provide a reliable and objective assessment of cognitive function, its role in concussion management is still not clearly defined.

ACADEMICS:

When a student-athlete is diagnosed with a concussion and evaluated by a team physician, the academic support staff of the student-athlete's sport will be notified. This is important to take into account the mental considerations of the concussed student-athlete, and also help initiate any anticipated academic accommodations that may be felt necessary during their recovery.

ROLE OF IMAGING:

The role of imaging (CT scans and MRI) is very limited in the management of concussion and for most cases, not necessary. For most concussions, these studies are usually normal. These imaging studies do, however, have a role in evaluating the concussed athlete when a concern exists for associated injuries, such as skull or orbital fractures, intracranial bleeds and seizures, or if the athlete's symptoms persist or deteriorate.

NON-SPORTS RELATED CONCUSSIONS:

The management of a student-athlete that suffers a non-sport related concussion will be the same as one that suffers a sport-related concussion, with the return-to-play decisions following the University of Michigan Athletics Concussion Management Policy.

Student-Athlete Health & Welfare

Concussion Management
Executive Summary

Revision Date: September 4, 2014

University of Michigan Athletic Medicine personnel will evaluate possible mild traumatic brain injured / concussed student-athletes as per the following guidelines-

Baseline Assessment-

a) Pre-Participation Physical Examination inclusive of a detailed history and brief neurologic assessment;
b) Michigan Sideline Assessment of Concussion (MSAC)
c) Neurocognitive Assessment – Axon CCT

Time of Injury-

Any student-athlete that exhibits signs, symptoms or behaviors consistent with a concussive injury, including, but not limited to:

1) **Altered level and/or loss of consciousness;**
2) **Confusion, as evidenced by disorientation to person, time, place, or situation; difficulty responding appropriately to questions; difficulty processing information correctly and/or respond appropriately analytical questions; or difficulty remembering assignments and/or plays;**
3) **Amnesia (antegrade and/or retrograde; immediate or delayed);**
4) **Abnormal neurological examination (i.e. abnormal pupillary response, persistent dizziness or vertigo, abnormal balance, etc.)**
5) **New and persistent headache, photosensitivity, other visual disturbances, tinnitus, nausea, vomiting, or dizziness; and/or**
6) **Any other persistent signs or symptoms of a concussive injury.**

must be evaluated by University of Michigan Athletic Medicine personnel. If the student-athlete is diagnosed with a concussion, the student-athlete should be withheld from participation for the remainder of that day.

- Certified Athletic Trainer assessment should include at a minimum-
  - Michigan Sideline Assessment of Concussion (MSAC);
  - Appropriate detailed documentation of the injury timeline, presence and severity of signs and symptoms, and other pertinent facts;
  - Head Injury Warning education, instruction, and handout

Neurocognitive testing and neuroimaging are to only be performed as directed by the evaluating University of Michigan Team Physician.

Return To Play-

Student-Athletes diagnosed with a concussion will be removed from participation for the remainder of the day of injury and will not be considered for return to participation until the student-athlete has been evaluated by a University of Michigan Team Physician and has successfully progressed through an individualized graded exercise and head injury assessment progression.

A University of Michigan Team Physician has the final authority in deciding if and when an injured student-athlete may return to practice and/or competition. *A student-athlete's private physician does not have any jurisdiction as to the participation status of the student-athlete.*

Any student-athlete seen by and/or under the care of a physician other than a University of Michigan Team Physician, must submit copies of any imaging and/or testing, physician's notes, and/or medical records, and must return to the University of Michigan Team Physician for a follow-up evaluation and final clearance prior to active participation status. If a student-athlete is under the care of a private physician for an injury or illness and the physician's treatment precludes or alters activity in intercollegiate athletics, the student-athlete must secure, **in writing**, a release to reinstate the student-athlete to full participation. No student-athlete will be allowed to return to participation until University of Michigan Student-Athlete Health and Welfare personnel has received a release from the private physician and the student-athlete is examined by a University of Michigan Team Physician and cleared for participation.

Academics-

- When a student-athlete is diagnosed with a concussion, the student-athlete's academic advisor should be notified by the University of Michigan Certified Athletic Trainer responsible for the team.
- Any restrictions and/or modifications in a student-athlete's academic program will be prescribed by a University of Michigan Team Physician in consultation with University of Michigan Academic Success Center personnel.