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Concussion Management Plan Guidelines

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TABLE OF CONTENTS

Acknowledgments	2
Introduction	3
SECTION 1: Planning Overview.....	5
Planning Overview	6
SECTION 2: Typical Elements Of A Concussion Management Plan	8
Statement of Support	9
An Accepted Definition of a Concussion	10
Signs and Symptoms of a Concussion.....	11
Preseason Baseline Testing	12
Evaluation	13
Referral to Emergency Department	14
Return to Physical Activity.....	15
Return to School	17
References	18



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Introduction

Sport-related concussions are a public health concern. Indeed, up to 10% of all college lacrosse^{1, 2}, 19% of boys club lacrosse³, and 23-25% of high school lacrosse injuries are concussions⁴. As a result, USA Lacrosse has developed guidelines for teams, clubs, and leagues to consider in the form of a Concussion Management Plan (CMP). These guidelines are not intended as a standard of care and should not be interpreted as such. They are a guide based on current national and international research and consensus statements⁵⁻⁷, and should be reviewed regularly to keep them current. Each CMP developed locally should be in consultation with a physician (MD/DO) trained in the evaluation and management of concussion as well as other involved healthcare providers in accordance with concussion management legislation in your state and should be reviewed and updated annually. It is recommended that each team, club, and league develop a CMP and educate all parents, coaches, and athletes on the content and required compliance with the CMP.

It is important to understand that no current helmet/headgear can prevent concussions. Current helmet/headgear standards are designed to reduce the risk of severe brain injury and skull fracture, not to prevent concussion. There are substantial efforts towards developing standards and helmet/headgear that can reduce the risk of concussions, but this remains a challenge. Additionally, there is no evidence to date that helmet/headgear reduces the risk of a second concussion or modify post-injury recovery.

An athlete who exhibits signs, symptoms, or behaviors suggestive of a concussion should be removed from practice or competition and not returned to play until evaluated by a health care professional with experience in the evaluation and management of concussions. Athletes diagnosed with or suspected of a concussion should not return to activity for the remainder of that day. Management and return to both academic/work and practice/play after concussion should be under the supervision of a physician or qualified healthcare professional. Organizations should review their state laws to determine which medical/healthcare professionals may provide clearance for return to activity. Medical clearance requirements should be included in the concussion management plan, including the need for written clearance.

In addition, athletes should acknowledge that they understand the signs and symptoms of concussion and accept the responsibility for reporting all of their injuries and illnesses to



their coach, parents (if minors), and health care professionals if present, including signs and symptoms of concussion. Some states may require a form to be signed for this acknowledgment. Athletes and their parents should be presented with educational material on head injuries and concussions.

It is important to have a clear and practiced plan for the management of sport-related concussions. **This document was created to contain guidelines on sport-related concussions, for licensed medical professionals, during medical emergencies.** The words and other content provided in these guidelines, in any linked materials or referenced resources (“referenced materials”) are not intended and should not be construed as medical advice.

We believe that the Healthcare providers who are responsible for caring for the lacrosse athletes should be familiar with the emergency action plan (EAP) of the host site and work with the local EMS to provide care for the potentially injured athlete. This document focuses on referenced materials to safely manage sport-related concussions. These are guidelines only and are not intended as a standard of care and should not be interpreted as such. Individual treatment will depend on the specific facts and circumstances presented to the healthcare provider(s) managing care.

Never disregard professional medical advice or delay in seeking it because of something you have read in these guidelines or referenced materials. **In the event of a medical emergency and a licensed medical professional is not available, call 911 immediately.**

For information regarding emergency facemask, headgear and helmet removal, please see [Facemask, Headgear, Helmet Removal](#).

These guidelines are based on current research and clinical best practice and will be updated as new evidence emerges.

The views expressed within these guidelines or referenced materials have no relation to those of any academic institution with which the authors are affiliated.



SECTION 1.

Planning Overview



Planning Overview

The plan should include, but is not limited to, the following:

1. A process that provides athletes, parents, coaches, and league administrators with educational information about concussions including; the signs and symptoms, mechanisms of injury, treatment, return to activity guidelines, and limitations of protective equipment. Athletes, parents, coaches, and league administrators should acknowledge that they have received information about the signs and symptoms of concussions and understand the importance of promptly reporting all signs and symptoms of concussion as well as all injuries and illnesses to their coach, parents and healthcare providers, if available. For larger leagues it might be helpful to designate an athlete safety coordinator to help implement and update the plan. The Concussion Recognition

Tool ⁸ developed by the International Concussion in Sport Group (CISG) Consensus Statement as well as the information developed by the Center for Disease Control (CDC) (https://www.cdc.gov/headsup/basics/concussion_what.html) are useful resources.

2. A process that provides athletes, parents, coaches and league administrators with educational information about concussions, including how academic and work activities might be affected by the concussion and how to incorporate a “return to learn” strategy as a component of the return to sport progression.
3. A process that removes an athlete who exhibits signs, symptoms or behaviors suggestive of a concussion from athletic activities (e.g., competition, practice, conditioning sessions) and does not allow return to play until that athlete is evaluated and cleared (in writing) by a healthcare professional with experience in the evaluation and management of concussions and who is authorized to do so in the state in which they are practice.
4. A policy that precludes an athlete diagnosed with a concussion from returning to athletic activity (e.g., competition, practice, conditioning sessions) for at least the remainder of that calendar day in which the inciting event occurred.
5. A policy that provides a multi-step outline of the return-to-play and return to academic work progression, how it will be managed and what players, coaches and parents should expect if there is a concussion diagnosis.



SECTION 2.

Typical Elements of a Concussion Management Plan



Statement of Support

A statement of unequivocal support from organization leadership for the CMP, including strict adherence to the reporting, removal from play, and educational requirements. The plan should include a date to indicate the organization and its consulting medical professionals have reviewed the plan within the past twelve months.

An Accepted Definition of a Concussion

Although many definitions of concussion exist, we find the one reference below from the 5th International Concussion in Sport Conference (2017)⁵, to be the most useful:

“Sport related concussion (SRC) is a traumatic brain injury induced by biomechanical forces. Several common features that may be utilized in clinically defining the nature of a concussive head injury include:

- (a) SRC may be caused either by a direct blow to the head, face, neck or elsewhere on the body with an impulsive force transmitted to the head.
- (b) SRC typically results in the rapid onset of short-lived impairment of neurological function that resolves spontaneously. However, in some cases, symptoms and signs may evolve over a number of minutes to hours.
- (c) SRC may result in neuropathological changes, but the acute clinical signs and symptoms largely reflect a functional disturbance rather than a structural injury and, as such, no abnormality is seen on standard structural neuroimaging studies.

SRC results in a range of clinical signs and symptoms that may or may not involve loss of consciousness. Resolution of the clinical and cognitive features typically follows a sequential course. However, in some cases symptoms may be prolonged. The clinical signs and symptoms cannot be explained by drug, alcohol, or medication use, other injuries (such as cervical injuries, peripheral vestibular dysfunction, etc.) or other comorbidities (e.g., psychological factors or coexisting medical conditions).

Signs and Symptoms

Those suggested by the Centers for Disease Control in their lacrosse specific Heads-Up materials:

Signs Observed by Others following a direct or indirect blow to the head :

- Appears dazed or stunned
- Is confused about assignment or position
- Forgets an instruction
- Is unsure of game, score or opponent
- Moves clumsily
- Answers questions slowly
- Loses consciousness (even briefly)
- Shows mood, behavior or personality changes
- Can't recall events prior to hit or fall
- Can't recall events after hit or fall

Symptoms Reported by Athlete following a direct or direct blow to the head:

- Headache or “pressure” in head
- Nausea or vomiting
- Balance problems or dizziness
- Double or blurry vision
- Sensitivity to light or noise

Preseason Baseline Testing

Pre-participation baseline evaluation should be encouraged, if available. This ideally includes a baseline physical examination as well as a review of the athlete's history of prior injuries, co-existing medical issues (e.g., history of migraines, learning disabilities, mental health issues, as well as a baseline evaluation of symptoms, cognitive and neurologic function, including balance). Though not essential, it may be useful to include more sophisticated neuropsychological testing, but only if these tests are performed in a supervised, controlled setting along with post injury interpretation by those experienced in interpreting neuropsychological tests. This information should be managed by the athlete's healthcare provider so that it is available for appropriate post injury evaluation, should it be necessary.

Evaluation

An athlete exhibiting signs and symptoms of a concussion should be removed from play immediately and evaluated by a healthcare provider with experience in concussion assessment and management. A brief standardized screening tool; assessing symptoms, cognitive and neurologic function including balance (e.g., SCAT5⁹ or child SCAT5¹⁰) should be used by the healthcare provider. Any athlete who is diagnosed with a concussion shall not return to activity for the remainder of that day and be referred to a physician or qualified healthcare professional. Assessment of the athlete will be conducted at time intervals as determined by his or her healthcare provider. The athlete will not be allowed to return to activity until cleared (in writing) by an appropriate healthcare provider as defined and authorized by state legislation.

Referral to Emergency Department

Each club, team, or league should have an Emergency Action Plan (EAP) in place for each of the play and practice venues, each of which incorporates the CMP. Teams or clubs traveling to new venues should obtain and review in advance the site-specific EAP from the host. Should an athlete experience deterioration of level of consciousness, decreasing neurologic function, and/or exhibit signs and symptoms associated with a severe head or neck injury, consideration for a more serious brain injury such as intracranial hemorrhage, skull fracture, or cervical spine compromise should be considered, and the EAP should be activated.

Return to Physical Activity

Current recommendations suggest that athletes diagnosed with a concussion should engage in relative rest (no exacerbation of existing symptoms or development of new symptoms) both physically and cognitively for an initial period of 24-48 hours, and should not return to contact sport activities until they are back to their baseline level of symptoms, cognitive function and balance. Prolonged rest is NOT recommended and may prolong recovery. After an initial period of rest, the athlete may resume low level activities that do not aggravate their symptoms and a graduated return to sport strategy can be followed under the guidance of a healthcare professional. The athlete should gradually increase their level of exertion and risk for contact and be followed for the development of any new symptoms or complications. Written documentation from the healthcare provider should be maintained by the league administrator or designated athlete safety coordinator for the return to sport progression. The return to sport strategy from the CISG is provided in Table 1. The return to play progression is individualized, incorporating the athlete's medical history related to the specific injury (e.g., the nature, burden and duration of symptoms, prior concussion history, history of migraines, learning disabilities, depression/anxiety) as well as how the athlete responds to each step of the progression. There is no definitive timeline for return-to-play and "cookbook" approaches are not recommended.

Table 1. Graduated return-to-sport (RTS) strategy ⁵

Stage	Aim	Activity	Goal of each step
1	Symptom-limited activity	Daily activities that do not provoke symptoms	Gradual reintroduction of work/school activities
2	Light aerobic exercise	Walking or stationary cycling at slow to medium pace. No resistance training	Increase heart rate
3	Sport-specific exercise	Running or skating drills. No head impact activities	Add movement
4	Non-contact training drills	Harder training drills, e.g., passing drills. May start progressive resistance training	Exercise, coordination, and increased thinking
5	Full contact practice	Following medical clearance, participate in normal training activities	Restore confidence and assess functional skills by coaching staff
6	Return to sport	Normal game play	

- NOTE: An initial period of 24–48 hours of both relative physical rest and cognitive rest is recommended before beginning the RTS progression. There should be at least 24 hours (or longer) for each step of the progression. If any symptoms worsen during exercise, the athlete should go back to the previous step. Resistance training should be added only in the later stages (stage 3 or 4 at the earliest). If symptoms are persistent (e.g., more than 10–14 days in adults or more than 1 month in children), the athlete should be referred to a healthcare professional who is an expert in the management of concussion.

Return to School

Student-Athletes who sustain a concussion should receive the necessary support from their school for classes, exams, and schoolwork that may be affected as a result of a sustaining concussion and post-concussive symptoms. Parents and their healthcare provider should inform their child’s school requesting appropriate support. Types of academic support could include extended time on tests, reduced workload, limited homework time, decreased computer use, testing in a distraction free environment. The return to school strategy from the CISG is provided in Table 2.

Table 2. Graduated return-to-school strategy ⁵

Stage	Aim	Activity	Goal of each step
1	Daily activities at home that do not give the child symptoms	Typical activities of the child during the day as long as they do not increase symptoms (e.g., reading, texting, screen time). Start with 5–15 min at a time and gradually build up	Gradual return to typical activities
2	School activities	Homework, reading or other cognitive activities outside of the classroom	Increase tolerance to cognitive work
3	Return to school part-time	Gradual introduction of schoolwork. May need to start with a partial school day or with increased breaks during the day	Increase academic activities
4	Return to school full time	Gradually progress school activities until a full day can be tolerated	Return to full academic activities and catch up on missed work

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