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ST. LUKE'S SPORTS MEDICINE CONCUSSION POLICY AND MANAGEMENT GUIDELINES – PENNSYLVANIA

Protocol Statement: This document outlines protocol and procedures to assist in the management of concussions and the safe return to academics and sport for student-athletes managed by St. Luke's University Health Network.

Purpose: To define, develop and communicate a comprehensive outline for the Sports Medicine team on the proper recognition, evaluation, and management of a student-athlete who sustains a concussion.

Definition of Concussion: A concussion is a brain injury defined as a complex pathophysiological process affecting the brain, induced by biomechanical forces.¹ Other key defining features of concussions include:

1. Occur from forces applied directly or indirectly to the skull, face, neck, shoulders, and other parts of the body that result in the rapid acceleration and deceleration of the brain.²
2. Result in the rapid onset of temporary clinical and neurological symptoms. A loss of consciousness does not always occur, but may occur with a concussion. In some cases, signs and symptoms may evolve over a number of minutes to hours.²
3. May result in neuropathological changes; however, the acute clinical symptoms largely reflect a functional disturbance rather than a gross structural injury. In such cases no abnormality may be seen on standard structural neuroimaging studies.²
4. Resolution of the clinical and neurological symptoms typically follow a sequential course. However, in some cases this may be prolonged.²

SECTION I: EDUCATION REQUIREMENTS

In accordance with the **Safety in Youth Sports Act**³, the following educational programs and requirements for all St. Luke's affiliated groups including coaches, parents and student-athletes has been established.

1. An informational meeting on concussions should be held annually or before each sport season for coaches, parents and student-athletes. These meetings should include but not limited to:
 - a. Prevention Strategies
 - b. Management
 - c. Plan of Care
 - d. Return to Academics
 - e. Return to Play

2. Parents will share in the success of the St. Luke's Sports Medicine Concussion Policy by attending scheduled educational sessions and supporting their children as they adhere to the guidelines and progress through the recovery process.
3. All student-athletes are suggested to complete baseline neuropsychological testing⁴ (ImPACT®) administered by a member of the St. Luke's Sports Medicine Team.
4. All students desiring to participate in any athletic program and the student's parent or guardian shall, sign and return to the school an acknowledgement of their receipt and review of concussion and traumatic brain injury information each school year.
5. All members of the Sports Medicine Team who are authorized to make decisions on when the student-athlete can return to play must complete, or have completed, training in the evaluation and management of concussion.
6. Additional training material is available on-line through the Pennsylvania Department of Education or Health (www.state.pa.us) and through the Centers for Disease Control and Prevention (www.cdc.gov).

SECTION II: PREVENTION STRATEGIES

Student-Athlete

1. Student-athletes will be educated on the importance of taking responsibility for reporting their signs and symptoms to their coach, parent, and athletic trainer, as well as adhering to the St. Luke's Sports Medicine Concussion Policy.
2. Each student-athlete is suggested to complete the baseline neuropsychological test (ImPACT®₃). Baseline testing will be completed prior to their first year of participation and retaken biannually.
3. The student-athlete is responsible for performing daily inspections of their equipment and reporting any issues to the appropriate designate prior to the next team event. The student-athlete may not perform any maintenance on their equipment nor alter their equipment. Sports equipment includes but is not limited to helmets, protective eye wear and mouth guards.

Coach

1. The concussion policy will be reviewed annually with coaches by members of the St. Luke's Sports Medicine Team.
2. Once each year, all coaches will be required to complete a PA Department of Health approved concussion management certification course.⁵
 - a. See the following link: <http://www.piaa.org/news/details.aspx?ID=2924>
3. All headgear must be certified by the appropriate governing organization and fitted by a designate that has appropriate knowledge of equipment fitting.^{6,7}

Parents

1. Parents will be educated on the importance of reporting their child's signs and symptoms to the coach, Athletic Trainer, or other appropriate school official as well as adhering to the Concussion Policy.

SECTION III: MANAGEMENT

Step 1: Acute Management

- A. Any student-athlete who exhibits any signs and/or symptoms of a concussion while participating in a school sponsored athletic event will be removed from activity for the day and not allowed to perform any activities that may increase the severity of the signs and/or symptoms.
- B. If an Athletic Trainer or a Team Physician is on site, the student-athlete will be referred to that individual for an immediate concussion evaluation.²
 - A. The recognition of a suspected concussion is therefore best approached using multidimensional testing guided via expert consensus.
 - B. At a minimum the SCAT 5 should be performed following injury.
 1. Child SCAT5 should be utilized when evaluating student-athletes ages 12 and younger.
 2. SCAT5 should be utilized when evaluating student-athletes ages 13 and above.
- C. After examination by the Team Physician or Athletic Trainer, a student-athlete who is suspected to have suffered a concussion will be excluded from participation for the remainder of the day. Return to participation on the same day will only be allowed if the Team Physician and/or Athletic Trainer determine that no concussion or other brain injury has occurred and the student-athlete is otherwise in good health.
- D. The Athletic Trainer must contact the student-athlete's parents or guardian if he or she is exhibiting any signs and/or symptoms of a concussion or other brain injury.
- E. If a Physician or Athletic Trainer is not present at the event, the head coach for the team will be responsible for keeping the student-athlete out of play for the day and must contact the Athletic Trainer and the parent or guardian of the student-athlete.

Step 2: Monitoring and Emergent Referral

- A. Following a suspected concussion, the Athletic Trainer should perform serial monitoring every 15-20 minutes for signs of cognitive or neurological deterioration.
- B. Any deterioration or displaying of the following signs or symptoms will warrant immediate emergency referral:
 - a. Loss of consciousness
 - b. Deterioration of neurological function
 - c. Decreasing level of consciousness
 - d. Abnormally unequal, dilated, or unreactive pupils
 - e. Any signs or symptoms of associated head/neck injuries, spine or skull fractures, or bleeding
 - f. Changes in mental status
 - g. Slurring of speech
 - h. Headaches that are worsening over time
 - i. Inability to recall new events after the injury (Anterograde amnesia)

- j. Seizure
- k. Repetitive vomiting
- C. Parents will be notified of concussion as soon as able once student-athlete is stabilized.
 - a. A written copy of home and school instructions will be provided to and reviewed with the parents (ie. Last page of the SCAT5, CDC references, additional school handouts).
- D. Student-athletes will be withheld from vigorous activity until cleared by a physician.

Step 3: Plan of Care

- A. The student-athlete will be referred to a physician trained in the evaluation and management of concussions. The Athletic Trainer will help to facilitate this appointment with a St. Luke's concussion specialist.
 - a. The physician will make return to school recommendations and articulate this with the student-athlete, parent/guardian, and Athletic Trainer.
 - b. The Athletic Trainer will be responsible for notifying coaches of the student-athletes concussion, and will be updated regularly on their appropriate level of participation.
- B. The student-athlete will be instructed to check in with the Athletic Trainer daily and if applicable the school nurse (secondary school setting only).
 - a. A Graded Symptom Checklist (GSC) will be completed daily by the Athletic Trainer. The Athletic Trainer will maintain daily logs with HIPAA compliance.
 - b. A decline in condition will be communicated directly to the treating physician.
- C. The physician may establish post-concussive (neuropsychological [ImPACT®], vestibular, ocular, cognitive) testing timeline.
 - a. Athletes will not have more than one neuropsychological test in a seven-day period of time unless outlined in treatment plan of the physician.

Step 4: Return to Academics

Secondary School

- A. The Athletic Trainer and parent/guardian will work together to ensure the school nurse is notified once concussion is suspected and physician notes given upon receipt. The school nurse and school guidance counselor will work collaboratively to notify the appropriate teachers of the student-athlete's concussion, and possible classroom modifications (see addendum 1 for an example). Special classroom modifications may include but are not limited to:
 - a. Take rest breaks as needed
 - b. Spend fewer hours at school (have a shortened school day)
 - c. Be given more time to take tests or complete assignments. (All courses should be considered)
 - d. Receive help with schoolwork (e.g. pre-teaching, outlines, note-taker).

- e. Reduce time spent on the computer, reading, and writing.
 - f. Be granted early dismissal from each class to avoid crowded hallways.
 - g. No standardized testing (e.g. PSSA, SAT) until cleared by the treating physician
 - h. No band or chorus activities
- B. In Pennsylvania, BrainSTEPS⁸ teams are available to any **secondary school** in the Commonwealth. These teams have been developed by the Brain Injury Association of Pennsylvania with funding from the Pennsylvania Department of Health and the Department of Education. BrainSTEPS teams are designed to support the staff, student, parents or guardians in a return to school after a brain injury. These teams work with all parties to identify and implement appropriate accommodations and modifications to manage the student's symptoms and to support their learning needs throughout their secondary school career. The school (e.g. teachers, school counselors, school nurse) and family should monitor the performance of the student closely for 4 weeks after the return to school.⁸ If the return to the classroom causes concussion symptoms to re-occur or if the student demonstrates uncharacteristic performance (e.g. reduced attention span, inability to take tests, acting out in class), the school should initiate a formal referral to the local BrainSTEPS team (www.brainsteps.net).

Youth / Community Organizations

Due to the nature of youth or other community / private organizations the Physician and Athletic Trainer will be the resource responsible for educating families on the importance of school accommodation as necessary following a diagnosed concussion. Educational documents, such as the last page of the SCAT 5, are beneficial in outlining the steps necessary to return to academics. Emphasis must be noted on the importance of individual plans due to the nature of how various people heal and respond to injury.

Step 5: Return to Play

- A. Return to play depends on several factors
 - a. Children and adolescents should not return to sport until they have successfully returned to academics.
 - i. Early introduction of symptom-limited physical activity may be appropriate.²
 - b. Physical exam
 - c. Graded concussion symptom checklist
 - d. Past history of concussion or other brain injury
 - e. Neuropsychological (ImPACT[®]) testing scores
 - f. Recommendations of the St. Luke's medical staff and district athletic trainer
- B. The student-athlete must meet **ALL** of the following criteria to return to play:
 - a. Asymptomatic at rest, in the classroom, and with exertion
 - b. ImPACT[®] scores (when indicated) comparable to baseline and reviewed by concussion specialist unless otherwise described by the team physician
 - c. Written clearance from a physician must be obtained prior to beginning return-to-play protocol.

- i. If written clearance from a physician does not align with the St. Luke's Concussion Management Protocol, the student-athlete will not be allowed to return to play.
- ii. The Athletic Trainer has the final say in return-to-play.
- iii. If a question arises, the final decision for return-to-play would be of the school's Team Physician.

****Notes from outside physicians will not be used to override the St. Luke's protocol.***

- C. Progression through the return to play protocol is individualized and will be determined on a case-by-case basis. The speed of progression will be established by collaboration between student-athlete and the St. Luke's Sports Medicine Team.
- D. A graduated return to play protocol will be utilized. Each step will take, at a minimum, 24 hours unless the treating physician indicates otherwise. Student-athletes must remain asymptomatic prior to taking the next step. If symptoms return, a 24-hour suspension of progression will take place before resuming the level that the athlete completed without experiencing any signs or symptoms.
 - a. If symptoms return during progression, student-athlete should be removed from participation until symptoms resolve.
 - b. If symptoms do not resolve, student-athlete should be referred back to the treating physician for re-evaluation.
 - c. If the student-athlete remains at the same step of the graduated return to play protocol for three days, the athlete should be referred back to the treating physician for re-evaluation.
- E. St. Luke's utilizes the Berlin Consensus Statement from the 5th International Congress on Concussion in Sport² (Each step requiring a minimum of 24-hours)
 - a. Athlete remains symptom-free, off medication, for a 24 hour period while completing a day of normal cognitive activities (school day, studying for class, and interaction with peers). If no return of symptoms, progress to next step:
 - b. Light aerobic exercise, 15-40 minutes in length, keeping the intensity <70% maximum predicted heart rate. The objective is to increase heart rate. If no return of symptoms, progress to next step:
 - c. Sport specific drills, 15-40 minutes in length. Drills should be individual (i.e. change of direction, change of pace/intensity, cutting, agility) and exclude all head impact activities. The objective is to add movement while continuing to increase heart rate. If no return of symptoms, progress to next step:
 - d. Non-contact training drills, may be done individually or with a team. This may include sport specific skills such as passing, shooting, throwing, etc. Progressive resistance training may begin during this phase. If no return of symptoms, progress to next step:
 - e. Unrestricted participation in practice or normal training activities. The student-athlete may participate in all team drills, including contact, in practice only. The objective is to restore confidence to the student-athlete and assess

functionality of the athlete during play. If no return of symptoms, progress to next step:

- f. Return to play involving normal exertion or game activity
- F. If symptoms persist and unable to complete RTL or RTP follow-up care should be initiated with collaboration with treating physician. Referral may be warranted to Physical Therapy, Neurology, or other concussion trained specialist.

SECTION IV: RESOURCES

Resources on Interscholastic Sports Related Concussions and Head Injuries Internet Resources

Centers for Disease Control and Prevention – Concussion Toolkit

http://www.cdc.gov/concussion/HeadsUp/physicians_tool_kit.html

<http://www.cdc.gov/concussion/headsup/pdf/ACE-a.pdf>

http://www.cdc.gov/concussion/headsup/pdf/ACE_care_plan_school_version_a.pdf

http://www.cdc.gov/concussion/headsup/pdf/Concussion_in_Sports_palm_card-a.pdf

National Federation of State High Schools Association- Online “Concussion in Sports” training program.

www.nfhs.org

Brain Injury Association of Pennsylvania (BIAPA)

www.biapa.org

Pennsylvania Athletic Trainers Society (PATS)

www.gopats.org

National Collegiate Athletic Association (NCAA)

www.NCAA.org/health-safety

Pennsylvania Interscholastic Athletic Association (PIAA)

www.piaa.org

Pennsylvania Physical Therapy Association (PPTA)

www.ppta.org

Articles

“Consensus Statement on Concussion in Sport: 3rd International Conference on Concussion in

Sport held in Zurich, November 2008”. Clinical Journal of Sports Medicine, Volume 19, May 2009, pp.185-200

Halstad ME, Walter, KD and the Council on Sports Medicine and Fitness, Clinical Report: Sport-related Concussion in Children and Adolescents” Pediatrics Volume 126, September 2010, pp.597-615.

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1. What is a Concussion? *Concussion-U*. September 2014.
<https://concussionu.wordpress.com/what-is-a-concussion/>. Accessed December 1, 2017.
2. McCrory P, Meeuwisse W, Dvořák J, et al. Consensus statement on concussion in sport-the 5th international conference on concussion in sport held in Berlin, October 2016. *Br J Sports Med*. 2017;51(11):838-847. doi:10.1136/bjsports-2017-097699.
3. Safety in Youth Sports Act - Enactment Act of Nov. 9, 2011, P.L. 411, No. 101. The official website for the Pennsylvania General Assembly.
<http://www.legis.state.pa.us/cfdocs/legis/li/uconsCheck.cfm?yr=2011&sessInd=0&act=101>. Accessed December 1, 2017.
4. ImPACT Testing & Computerized Neurocognitive Assessment Tools.
<https://www.impacttest.com/>. Accessed December 1, 2017.
5. Requirements to Coach in PIAA Member Schools Information.
<http://www.piaa.org/news/details.aspx?ID=2924>. Accessed December 1, 2017.
6. NOCSAE | National Operating Committee on Standards for Athletic Equipment.
<http://nocsae.org/>. Accessed December 1, 2017.
7. NOCSAE Statement Regarding Add-on Helmet Products - PIAA.
<http://www.piaa.org/news/details.aspx?ID=2998>. Accessed December 1, 2017.
8. Concussion and acquired brain injury support for Pennsylvania schools - BrainSTEPS.
<http://www.brainsteps.net/>. Accessed December 1, 2017.



Addendum 1

I hereby acknowledge that I have read and understand the St. Luke's Sports Medicine Concussion Policy and Management Guidelines.

Student's Signature

_____ Date ____/____/____

Parent's/Guardian's Signature

_____ Date ____/____/____



Addendum 2

Concussion Awareness Letter

__/__/__

The St. Luke's Sports Medicine Team and _____ (*insert school name*) Athletic Department would like to inform you that _____ (*insert student-athlete name*) sustained concussion-like symptoms during _____ (*insert sport*) on __/__/__. He/she was evaluated by _____ (*insert Athletic Trainer name*). He/she is awaiting an appointment with a physician.

As a department, we wanted to make you aware of this injury and the related symptoms that the student-athlete may experience. Although the student is attending class, please be aware that the side effects of the concussion may adversely impact his/her academic performance. Any consideration you may provide academically during this time would be greatly appreciated. We will continue to monitor the progress of this student-athlete and anticipate a full recovery. Should you have any questions or require further information, please do not hesitate to contact us.

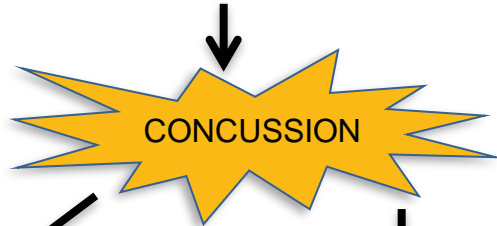
Thank you in advance for your time and understanding with this circumstance

Healthcare Provider Signature Date

Student-Athlete Signature Date

PRE-SEASON
- Education
- Baseline Testing

Effective concussion management begins well before the injury occurs. During the Pre-Season, trained staff from St. Luke's Sports Medicine provide educational seminars to athletes, parents, coaches, and athletic trainers.



SCAT5 will be performed following injury. Graded symptom checklists will be performed daily after a suspect concussion.

Emergency Department with worsening symptoms/Red flags

ACUTE STAGE
-Sideline Assessment
-Follow Concussion Management Protocol

St. Luke's collaborates with coaches, athletic trainers, and school nurses to effectively manage the concussion until the athlete can be safely returned to full physical and cognitive activity.

MANAGEMENT STAGE
-Referral to Physician Trained in Concussion Management
-Individualized Plan of Care
-Assessment of Return to Play and Return to Academics

Not Cleared

Written Clearance from Concussion Trained Physician

MANAGEMENT STAGE
-Physical and cognitive rest as advised
-Return to Academics
-Identify need for rehabilitation
- Additional testing/therapy as needed

CLEARANCE TO RETURN
-Graded return to play Protocol
-Return to Academics
-Follow-up and monitor athlete

