Geisinger Sports Medicine Concussion Policy

INTRODUCTION

This document outlines the protocol and procedures to be used in the management of concussions by Geisinger Sports Medicine staff. The purpose is to define, develop, and communicate uniform guidelines regarding the proper identification, evaluation, clinical findings, return to academics, and return to sport for student-athletes.

DEFINITION OF CONCUSSION

Per the 5th International Conference on Concussion in Sport[1], *"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:*

- *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.*
- *SRC typically results in the rapid onset of short-lived impairment of neurological function that resolves spontaneously. However, in some cases, signs and symptoms evolve over a number of minutes to hours.*
- *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)."*

The following is a non-exhaustive list of common signs and symptoms of SRC:

Cognitive / Thinking	Somatic / Physical	Affective / Emotional	Sleep
Confusion	Headache	Sadness	Drowsiness
Disorientation	"Pressure in head"	Irritability	Sleeping more than usual
Difficulty concentrating	Dizziness	Nervous or anxious	Trouble falling asleep
Difficulty remembering	Balance problems	Feeling more emotional	Sleeping less than usual
"Don't feel right"	Nausea or vomiting	Fatigue or low energy	
Feeling slowed down	Fuzzy or blurred vision		
Feeling like "in a fog"	Sensitivity to light		
	Sensitivity to noise		

In an athletic environment, an athlete with a concussion may exhibit the following signs[2]:

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

PRESEASON EDUCATION

Secondary School Setting

In accordance with the PA Safety in Youth Sports Act[3,4]:

- All student-athletes and their parents or guardians will be required to annually review, sign and return Section 3 of the CIPPE[5] form *"Understanding of Risk of Concussion and Traumatic Brain Injury"*.
- A Geisinger Sports Medicine staff member will be available as a school resource and may hold an annual informational meeting for student-athletes, parents, and/or coaches regarding proper concussion management.
- Each school district is responsible for ensuring the above requirements are satisfied.

University/Collegiate Setting

In accordance with the NCAA's Sport Science Institute Concussion Safety Protocol[6]:

- All student-athletes, coaches, team physicians, athletic trainers, and directors of athletics will annually be provided the NCAA Concussion Fact Sheet[7,8] or similar applicable material for review and acknowledgement of understanding.
- Each institution is responsible for ensuring the above requirement is satisfied.

Sports Medicine Team

- All members of the Geisinger Sports Medicine Team who are authorized to make decisions on when student-athletes can return to play must have completed training in the evaluation and management of concussions.
    1. Athletic Trainers
    2. Geisinger Sports Medicine Physicians
    3. Geisinger Sports Medicine Fellows

MANAGEMENT OF CONCUSSIONS

Baseline Assessment

- Each student-athlete will complete a baseline assessment[9] administered by a Geisinger Sports Medicine staff member prior to his/her first year of sport participation.
- Secondary school student-athletes will repeat this baseline assessment biennially. All University/Collegiate setting student-athletes, regardless of sport will have their baseline assessment annually when they arrive on campus. The baseline assessment will include one or both of the following tests:
    1. Computerized neurocognitive testing
    2. Sport Concussion Assessment Tool - 5th Edition[10] (SCAT5; with additional Geisinger recommended tests)

Acute Management

- If a student-athlete exhibits signs or symptoms of a concussion while participating in a school sponsored athletic activity, the student-athlete must be:
    1. Removed from practice or competition immediately

2. Referred to the on-site athletic trainer or team physician trained in the evaluation and management of concussions for initial evaluation
    a. If an athletic trainer or team physician is not on-site or readily available to perform the initial evaluation, all members of the coaching staff are responsible for keeping the student-athlete out of practice or competition for the remainder of the day and a member of the coaching staff must contact the athletic trainer and parent or guardian of the student-athlete.

- The initial concussion evaluation will include, at minimum, the following tests to rule out emergent conditions:
    1. No-Go's / Red flags / Observable signs (SCAT5; Geisinger Pocket Card)
    2. Glasgow Coma Scale (SCAT5)
    3. Cervical spine assessment (SCAT5; Geisinger Pocket Card)
    4. Neurological Screen (Ocular and Cranial Nerve Exam; Geisinger Pocket Card)
    5. Symptom evaluation (SCAT5)
- When the return to play decision must be made during practice or competition, the sideline or on-field evaluation will include all above listed tests in addition to the following:
    1. History of Event / Mechanism of Injury (Geisinger Pocket Card)
    2. Maddock's / Orientation questions (SCAT5; Geisinger Pocket Card)
    3. Cognitive Screen (Geisinger Pocket Card)
    4. Balance Screen (modified Balance Error Scoring System; modified Romberg Test; Tandem Gait)
    5. Vestibular Ocular Motor Screen (Geisinger Pocket Card)
    6. Exertional Testing (Geisinger Pocket Card)

  ****It should be noted that the above assessment may be discontinued at any point following a suspicious finding that leads clinician to suspect concussion.****
- The office or athletic training room evaluation will include all above listed tests (with the exception of Exertional Testing) in addition to the following:
    1. Athlete background (SCAT5)
    2. Standardized Assessment of Concussion (SCAT5)
- Emergency Action Plan activation and emergent referral will occur for any of the following:
    1. Glasgow coma scale < 13
    2. Prolonged loss of consciousness
    3. Deteriorating conscious state
    4. Focal neurological deficit suggesting intracranial trauma
    5. Severe or increasing headache
    6. Repeated emesis or vomiting
    7. Impact seizure, posturing, or convulsions
    8. Spine injury
- Following the initial evaluation by the on-site athletic trainer or team physician, 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 athletic trainer and/or team physician determine that no concussion or other brain injury has occurred, and the student-athlete is otherwise in good health.

- Secondary School Setting:
    1. The athletic trainer must contact the student-athlete's parent/guardian if the student-athlete is exhibiting any signs or symptoms of a concussion or other brain injury, or if the athletic trainer feels that such contact is necessary based on his/her professional judgment.
    2. A written copy of home and school instructions[11] will be provided to and reviewed with the parent or guardian as soon as able. (i.e., Geisinger Home Care Instructions, Page 8 of SCAT5, CDC references, additional school handouts, etc.).

- University/Collegiate Setting:
    1. Athletic trainer must review take home, academic and follow-up instructions with the injured student-athlete. An explanation of the concussion protocol should be reviewed with the student-athlete at the time of injury.
    2. With the student-athlete's permission, the athletic trainer will contact a person that can check-up on the student-athlete's well-being such as a roommate, coach, residence life personnel, friend/teammate, or another person the student-athlete deems appropriate.
    3. A parent/guardian will only be contacted:
        a. In emergency situations
        b. Student-athlete is <18 years old
        c. If advised by the student-athlete

Follow Up and Plan of Care

- Any student-athlete who is suspected to have suffered a concussion must report to the athletic trainer as soon as able to confirm or rule out concussion diagnosis. Any or all of the previously mentioned tests may be performed or repeated in addition to any of the following to diagnose:
    1. Computerized neurocognitive test
    2. Buffalo Concussion Treadmill Test[12]
    3. Consultation with Geisinger Sports Medicine physician
- Any student-athlete diagnosed with a concussion will be instructed to follow-up with the athletic trainer daily, and if applicable, the school nurse (secondary school setting only). Daily follow-up procedures will include at minimum:
    1. Symptom evaluation (SCAT5)
    2. Repeat of any test found to be abnormal during initial or previous evaluations
    3. Rehabilitation exercises (as needed)
- Physician referral will occur at discretion of the athletic trainer and in collaboration with the student-athlete, student-athlete's parent or guardian, coach, and/or Geisinger Sports Medicine physician. The referral will be based on the following considerations:
    1. Student-athlete's health and concussion history
    2. Prolonged/protracted symptom recovery

3. Inability of student-athlete to complete any requirement for return to academics or return to play (see below)

Return to Academics

Secondary School Setting

- The athletic trainer and/or parent or guardian will work together to ensure the school nurse is notified once concussion is suspected. A multidisciplinary team (athletic trainer, school nurse, guidance counselor, etc.) will work collaboratively to notify the appropriate teachers of the student-athlete's concussion and any needed academic modifications.
- Academic modifications may include but are not limited to:
    1. Taking rest breaks as needed
    2. Spending fewer hours at school (shortened school day)
    3. Having more time to take tests or complete assignments
    4. Receiving help with schoolwork (e.g. pre-teaching, outlines, note-taker)
    5. Reducing time spent with reading, writing, or on the computer
    6. Early dismissal from each class to avoid crowded and noisy hallways
    7. No standardized testing (e.g. PSSA, SAT) until cleared by the treating physician
    8. No band, chorus, or physical education activities
- In Pennsylvania, BrainSTEPS[13] 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 parent(s)/guardian(s) should monitor the performance of the student closely for 4 weeks after the return to school. 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.

University/Collegiate Setting

- The athletic trainer will follow the institution's "Return to Learn" policy as outlined in the NCAA Concussion Safety Protocol.

<u>Return to Play (RTP)</u>

The Geisinger physical activity return to play protocol has been developed from multiple consensus and/or position statements.[1,14-16]

- Return to play depends on several factors:
    1. Children and adolescents should not return to sport until they have successfully returned to academics without the need of academic modifications
    2. Physical exam
    3. Symptom evaluation

4. Past history of concussion or other brain injury
5. Computerized neurocognitive test scores
6. Recommendations of Geisinger Sports Medicine staff

- The student-athlete must meet **ALL** of the following criteria for RTP:
    1. Concussion-related symptom scores have returned to baseline at rest, with cognitive exertion and physical exertion.
    2. Computerized neurocognitive test and/or SCAT5 (with additional Geisinger recommended tests) scores have returned to baseline levels and reviewed by Geisinger Sports Medicine physician or other designated party.
        a. If student-athlete is unable to satisfactorily complete the computerized neurocognitive test and/or SCAT5 the athletic trainer and/or treating physician may not advance the athlete through the return to play protocol without further clinical consultation with a physician.
    3. Written clearance from athletic trainer or team physician.
        a. If written clearance from a physician does not align with Geisinger Concussion Policy, the student-athlete will not be allowed to RTP.
        b. The athletic trainer will manage the RTP process; if questions or concerns arise, a Geisinger Sports Medicine physician will be consulted.
        c. Notes from outside physicians can and will be accepted; however, the student-athlete will be required to follow the Geisinger RTP protocol before fully cleared to return to play.
        d. All NCAA policies in regard to sports-related concussion will be followed.
- Progression through a multi-stage physical activity protocol will use the following guidelines:
    1. Each stage will last approximately 24 hours unless otherwise indicated by a Geisinger Sports Medicine physician.
    2. Concussion-related symptom scores must remain at baseline level prior to progressing to any subsequent stage.
    3. If concussion-related symptoms return during or within 24 hours of completion of any stage, the physical activity progression will be suspended until symptoms return to baseline level for a 24 hour period, at which time the student-athlete will resume physical activity at the previous stage completed.
    4. If concussion-related symptoms do not return to baseline level, or student-athlete repeatedly experiences concussion-related symptoms during any stage, physician consultation and/or referral will occur.
        a. With the consultation between athletic trainer and Geisinger Sports Medicine physician, stages of the concussion protocol could be altered or extended to ensure safe progression of the student-athlete.
- Prior to beginning the return to play protocol, the student-athlete must demonstrate a normal clinical examination with resolution of concussion-related symptoms (without the use of medication) for a 24 hour period, as well as completing a day of normal cognitive and/or academic activities (i.e. reading, note taking, studying, quiz/test taking, screen time, interacting with peers, etc.).

1. Stage 1:
    a. Objective is to establish submaximal exercise tolerance by increasing heart rate and blood pressure.
    b. Low intensity steady state aerobic exercise (walk, stationary bike, elliptical) should be introduced for 15-20 minutes.
    c. No formal sport practice at this time.
2. Stage 2:
    a. Objective is to further increase heart rate and blood pressure while introducing basic head movement.
    b. Moderate intensity aerobic exercise (jog, swim for 25-30 minutes) and body weight exercise (squat, push up, lunge, etc.) should be introduced at this stage for a total of 30-40 minutes of activity.
    c. No formal sport practice at this time.
3. Stage 3:
    a. Objective is to introduce sport-specific activities that involve rotational head movements, coordination and thinking, as well as progress exercise intensity and time (40-60 minutes) without the risk of head impact.
    b. Drills and skills should include change of direction, change of pace/intensity, cutting, agility, jumping, passing, shooting, throwing, catching, etc. Progressive resistance training (traditional barbell and dumbbell lifts) may be done during this phase.
    c. Only non-contact activities are permitted. They should begin as individual drills and may progress to selective team activities.
4. Stage 4:
    a. Objective is to replicate game-like exercise intensity ($\geq$ 60 minutes) with limited and controlled physical contact activities (mat/bag drills, diving, etc.).
    b. The athletic trainer must ensure the student-athlete is exposed to high-intensity exercise during this stage, either as part of formal practice activities or performed individually on the sideline.
    c. Non-contact team activities are permitted. No live scrimmaging at this time.
5. Stage 5:
    a. Objective is to return to unrestricted, full contact practice or normal training activities, excluding competition. This will help restore confidence and assess functional skill tolerance.
6. Following successful completion of Stage 5, the student-athlete will be cleared for full, unrestricted return to competition and live game play.

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