



A concussion is a brain injury which results in a temporary disruption of normal brain function. A concussion is caused by a bump, blow or jolt to the head or body. Even what seems to be a mild bump to the head can be serious. A student-athlete does not have to lose consciousness (“knocked-out”) to suffer a concussion. A concussion may cause multiple symptoms. Many symptoms appear immediately after the injury, while others may develop over the next several days or weeks. The symptoms may be subtle and are often difficult to fully recognize.

Physical		Cognitive	Emotional	Sleep
Headache	Visual Problems	Feeling Foggy	Irritability	Drowsiness
Nausea/ vomiting	Fatigue	Feeling slowed down	Sadness	Sleeping less than normal
Dizziness	Sensitive to light and sound	Difficulty remembering stuff	Extra sensitive emotions	Sleeping more than normal
Balance problems	Numbness or tingling sensations	Trouble concentrating	Nervousness	Difficulty falling asleep

When should I take my child to the doctor?

All student-athletes who sustain a concussion need to be evaluated by a licensed health care professional who is familiar with sports concussion diagnosis, management, and rehabilitation. St. Luke’s Sports Medicine offers the services of licensed physicians who are trained in the evaluation and management of concussions. Please see contact information below for a St. Luke’s concussion trained physician.

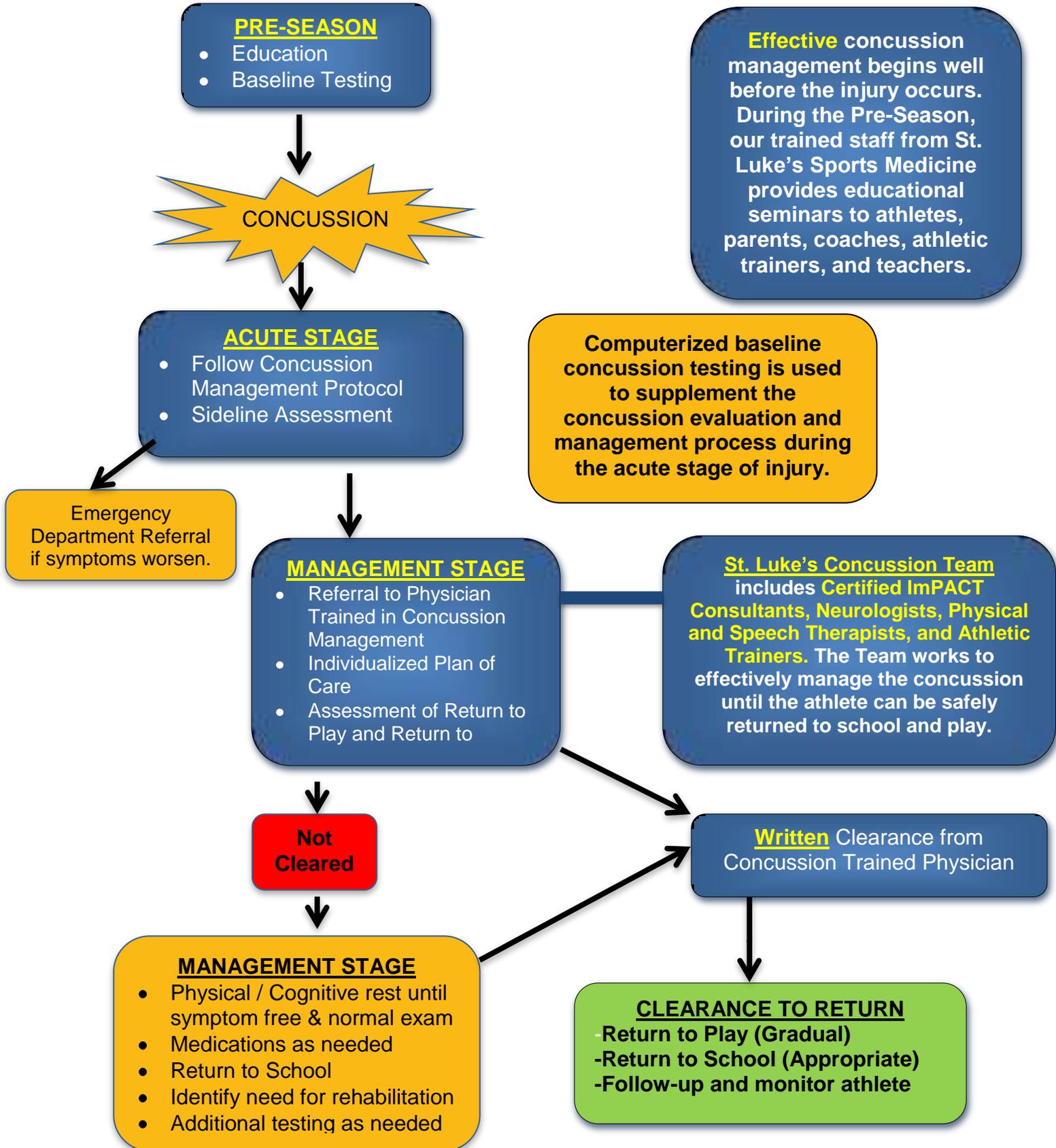
Maheep Vikram, MD
Sports Medicine Primary Care
Sports Medicine Family Practice

St. Luke’s Anderson Campus
St. Luke’s Bethlehem Campus
St. Luke’s North

Appointments can be made by calling **484-526-1735**. Physicians can be reached after-hours thru the hospital answering service. School Athletic Trainers can make appointments by calling the:

ATHLETIC TRAINER HOTLINE
610-360-0148
Athletic Trainers Please Use This Number
for FAST TRACK Appointments

ST. LUKE'S CONCUSSION MANAGEMENT PLAN AT-A-GLANCE





Wilson Sports Medicine – St. Luke's Sports Medicine Concussion Policy and Management Guidelines

Purpose: The purpose of this document is to describe the protocol and procedures that will be used to assist the Wilson Sports Medicine Team in the management of sport related concussions. These guidelines are aligned with current best practices and may be revised as new information becomes available. The primary objective of this program is the safe return of student-athletes to both their sport and the classroom. This Policy will guide the decisions of those individuals treated by Concussion Experts at St. Luke's Sports Medicine and the Wilson Sports Medicine Team.

Definition of Concussion: A concussion is a brain injury and is defined as a complex pathophysiological process affecting the brain, induced by biomechanical forces. Several common features that incorporate clinical, pathologic and biomechanical injury constructs that may be utilized in defining the nature of a concussive head injury include:

1. Concussion 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.
2. Concussion 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.
3. Concussion may result in neuropathological changes, but the acute clinical symptoms largely reflect a functional disturbance rather than a structural injury and, as such, no abnormality is seen on standard structural neuroimaging studies.
4. Concussion results in a graded set of clinical symptoms that may or may not involve loss of consciousness. Resolution of the clinical and cognitive symptoms typically follows a sequential course. However, it is important to note that in some cases symptoms may be prolonged.

Education Requirements: In accordance with the ***Safety in Youth Sports Act (November 9, 2011)***, the following educational programs and requirements for Wilson Area School District coaches, parents and student-athletes has been established.

1. A Sports Safety Informational Meeting that includes a discussion of sports related concussion, sudden cardiac death, and heat acclimatization guidelines will be held annually for coaches, parents and student-athletes.
2. Once each year, Wilson Area School District Coaches will be required to complete a PA Department of Health approved concussion management certification course (CDC, NFHS, etc.) In addition, each year an expert from the St. Luke's Sports Medicine Concussion Centers will review management guidelines with the Wilson Area School District Coaching Staff.



3. Parents will share in the success of the Wilson Area School District Concussion Management Program by attending scheduled educational sessions and supporting their children as they adhere to the guidelines and progress through the recovery process.
4. All Wilson student-athletes will, at a minimum, complete baseline neuropsychological testing (ImPACT®) administered by a member of the St. Luke's Sports Medicine Team.
5. Student-athletes will be educated about the importance of reporting concussions and adhering to the Wilson Area School District Concussion Management Program prior to each sports season.
6. A student desiring to participate in any athletic activity and the student's parent or guardian shall, each school year, sign and return to the school an acknowledgement of their receipt and review of concussion and traumatic brain injury information.
7. All members of the Wilson Area School District Athletic Training Staff/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. Material for this training is available on-line through the Pennsylvania Departments of Education or Health (www.state.pa.us) and through the Centers for Disease Control and Prevention (www.cdc.gov).



Management Guidelines

Protocol Statement: This document outlines the protocol and procedures to assist in the management of concussions and the safe return to play and academics for student-athletes managed by St. Luke's University Sports Medicine and the Wilson Athletic Training Staff.

Purpose: To develop and articulate a thorough method for the recognition, evaluation, and management of student-athletes who have sustained a concussion. Specifically, ensure the proper diagnosis and management of concussions as well as prevent prolonged recovery or permanent disability by comprehensively monitoring recuperation through regular contact with physicians and Licensed Athletic Trainers (LAT).

Signs and Symptoms Are as Follows:

Signs of Concussion:

(Could be observed by Coaches, Athletic Trainer, School/Team Physician, School Nurse, Physical Therapist)

The signs of a concussion include:

1. Appears dazed, stunned, or disoriented, demonstrates decreased alertness
2. Forgets plays, or demonstrates short term memory difficulty
3. Slurs words
4. Exhibits difficulties with balance or coordination.
5. Answers questions slowly or inaccurately.
6. Exhibits seizures or vomiting
7. Changes in level of consciousness. (Estimates are that <10% of concussions result in the loss of consciousness)

Symptoms of Concussion

(Reported by the student athlete to Coaches, Athletic Trainer, School/ Team Physician, School Nurse, Parent/ Guardian, Physical Therapist)

The symptoms of a concussion include:

1. Headache
2. Nausea
3. Balance problems or dizziness
4. Double vision or changes in vision
5. Sensitivity to light or sound/noise
6. Feeling sluggish or foggy
7. Difficulty with concentration and short term memory
8. Sleep disturbance
9. Irritability or changes in personality and behavior



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 LAT.
2. The student-athlete will be educated on the importance of adhering to the concussion protocol.
3. Each student-athlete will be required to complete the baseline neuropsychological test (ImPACT®) Baseline testing will be completed prior to their first year of participation and every other year until graduation. Acknowledgement on the Concussion Section of the CIPPE Pre-participation Examination Form constitutes approval for ImPACT Baseline Measurements.
4. The student-athlete is responsible for performing daily inspections of their equipment and must report any issues to the appropriate designate prior to the next team event.
5. The student athlete may not perform any maintenance on their equipment.

Coach

1. The concussion guidelines will be reviewed annually with coaches by members of the St. Luke's and Wilson Sports Medicine Teams
2. Once each year, all Wilson Area School District Coaches will be required to complete a PA department of health approved concussion management certification course.
3. All headgear must be NOCSAE certified and fitted by a designate that has appropriate knowledge of equipment fitting. This designate should perform routine inspections to ensure equipment is in proper working order.

Parents

1. Parents will be educated on the importance of reporting their child's signs and symptoms to the coach or LAT.
2. The parent will also be educated on the importance of adhering to the concussion protocol.

MANAGEMENT

Step 1: Acute Management

- A. Any student-athlete who exhibits any signs and/or symptoms of a concussion while participating on a school sponsored athletic team will be removed from the remainder of the event and not allowed to perform any activities that may increase the severity of the signs and/or symptoms.



- B. If a licensed athletic trainer (LAT) or a team physician is on site, the student-athlete will be referred to that individual for an immediate concussion evaluation using a standardized concussion evaluation form (SAC, SCAT 3, etc...).
- C. After examination by a team physician or Wilson LAT, 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 LAT determine that no concussion or other brain injury has occurred and the student-athlete is otherwise in good health.
- D. The team physician, Wilson LAT, or head coach 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 LAT 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 Wilson LAT and parents or guardian of the student-athlete.

Step 2: Monitoring and Emergent Referral

- A. Following a suspected concussion, the LAT 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.
 - i. Loss of consciousness
 - ii. Deterioration of neurological function
 - iii. Decreasing level of consciousness
 - iv. Abnormally unequal, dilated, or unreactive pupils
 - v. Any signs or symptoms of associated head/neck injuries, spine or skull fractures, or bleeding
 - vi. Changes in mental status
 - vii. Slurring of speech
 - viii. Headaches that are worsening over time
 - ix. Inability to recall new events after the injury (Antegrade amnesia)
- C. Parents will be notified of concussion.
 - a. A written copy of Home & School Instructions will be provided to and reviewed with the parents.
 - b. Emergency transport should always be offered even if not clinically mandated
- 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 LAT 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/guarding, and Wilson LAT
 - b. LAT will be responsible for notifying coaches of the student-athletes concussion, and will be updated daily on their appropriate level of participation.
 - c. LAT will be responsible for notifying school nurse, and teachers of the student-athletes concussion, and possible classroom modifications.
 - i. Special classroom modifications may include but are not limited to.
 - 1. Excused absence from school
 - 2. Half day or partial day of school
 - 3. Withheld from taking academically defining tests or exams
 - 4. Withheld from any and all physical conditioning (including physical education)
- B. The student athlete will be instructed to check in with the LAT daily.
 - a. Graded Symptom Checklist (GSC) will be completed daily by the LAT. Daily logs will be maintained by the LAT.
 - b. Decline in condition will be communicated directly to the treating physician.
- C. The physician will establish post-concussive neuropsychological (ImPACT[®]) 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 Play

- A. Return to play depends on several factors
 - a. Physical exam
 - b. Graded concussion symptom checklist
 - c. Past history of concussion or other brain injury
 - d. Neuropsychological (ImPACT[®]) testing scores
 - e. Recommendations of the St. Luke's medical staff and Wilson LAT
- B. The student athlete must meet **ALL** of the following criteria to return to play
 - a. Asymptomatic at rest and with exertion
 - b. ImPACT[®] scores within normal range of baseline and reviewed by concussion specialist
 - c. Written clearance from a physician
 - i. If written clearance from a physician does not align with the Wilson Concussion Management Protocol, the student-athlete will not be allowed to return to play.



*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, LAT, and St. Luke's medical staff.
- D. Graduated return to play will be utilized. Each step will take, at a minimum, 24 hours. Student-athlete 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 St. Luke's for re-evaluation.
- E. St. Luke's utilizes the Zurich Consensus Statement from the 4th International Congress on Concussion in Sport (Each step requiring a minimum of 24-hours)
 - a. Step 1: Symptom limited physical and cognitive rest
 - b. Step 2: Light aerobic exercises (i.e.: stationary bike, elliptical, static stretching)
 - c. Step 3: Sport-specific exercises (begin running program, initiate non-contact limited sport specific exercises)
 - d. Step 4: Non-Contact training drills (more complex sport specific training drills, may start resistance training)
 - e. Step 5: Full-Contact practice (following medial clearance, participate in normal training activities)
 - f. Step 6: Return to play (normal game play)
- F. ALL return to play guidelines must be met and each step must be completed in its entirety with LAT clearance prior to being cleared to participate.



Resources on Interscholastic Sports Related Concussions/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

Halstead 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.