

St. Luke's Sports Medicine Concussion Policy and Management Guidelines - Pennsylvania K-12 Policy & Procedures: Sports Medicine Relationships Sports Medicine Relationships Policy & Procedure Manual

**Scope:
Manual:**

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7/16

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I. Protocol Statement

1. This document outlines the protocols and procedures to assist in the management of concussion for the safe return to academics and athletics for patients managed by St. Luke's University Health Network. All parties should acknowledge that each concussion is unique, and that this policy provides guidelines for care; however, care plans should be individualized to address the needs of each patient and each unique injury with oversight of appropriate healthcare providers (ie. Athletic Trainers, Physicians, etc).

II. Purpose

1. To define, develop and communicate a comprehensive outline on the proper recognition, evaluation, diagnosis, and management of a student-athlete who sustains a concussion, based on best available evidence, to guide patient care decision-making to formulate a timely and appropriate management plan.

II. Definition

1. A concussion is a traumatic brain injury defined as a complex pathophysiological process affecting the brain, induced by biomechanical forces.^{1,2} Other key defining features of concussions include:
 - a. Caused by a direct blow to the head, neck or body resulting in an impulsive force being transmitted to the brain that occurs in sports and exercise-related activities.²
 - b. 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 minutes to hours.²
 - c. May result in neuropathological changes; however, the acute clinical symptoms reflect a functional disturbance rather than a gross structural injury. In such cases no abnormality may be seen on standard structural neuroimaging studies.²
 - d. Resolution of the clinical and neurological symptoms typically follow a sequential course. However, in some cases this may be prolonged.²

IV. Procedure

SECTION I: EDUCATION REQUIREMENTS

In accordance with the **Pennsylvania 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. The Athletic Trainer will facilitate an informational meeting on concussions annually or before each sport season for coaches, parents, and student-athletes. Execution of these meetings are at the discretion of the athletics' program assigned Athletic Training staff in collaboration with

athletic program administrators. It is recommended that educational materials of the information below be distributed electronically via email to coaches and parents/guardians who are unable to attend the informational meeting. These meetings should include but not limited to:

- a. Prevention Strategies
 - b. Management
 - c. Plan of Care
 - d. Return-to-Academics
 - e. Return-to-Sport.
2. 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 (i.e., Section 3 of the PIAA Pre-Participation Exam).
 3. Once each school year, a coach shall complete the concussion management certification training course offered by the Centers for Disease Control and Prevention, the National Federation of State High School Associations or another provider approved by the Department of Health.
 - a. Coaches should sign and return to the school an acknowledgement of their receipt of the concussion policy each school year (i.e., Addendum 1b).
 4. All members of the Sports Medicine Team who are authorized to make decisions on when the student-athlete can return-to-sport must complete, or have completed, training in the evaluation and management of concussion.
 5. Additional training material is available online 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 are highly encouraged to attend annual informational meetings on concussion where they will be educated on the importance of taking responsibility to report their signs and/or symptoms of a concussion to their Coach, Parent, or Athletic Trainer, as well as adhering to the St. Luke's Sports Medicine Concussion Policy.
2. All student-athletes participating in interscholastic athletics will complete at minimum a baseline ImPACT neuropsychological test. The Athletic Trainer may choose to use additional neuropsychological testing tool, such as the SCAT6, VOMS, or other approved neuropsychological tool.^{3,4}
 - a. Baseline ImPACT testing may be administered in-person at school or asynchronously at-home. If baseline testing is administered asynchronously, the Athletic Trainer should provide at-home instructions (i.e., Addendum 2).
 - i. If a student-athlete's ImPACT baseline test is deemed invalid (++) , the baseline test should be taken a second time under the supervision of a licensed Athletic Trainer or designee OR another validated neuropsychological testing tool should be used. If any questions or concerns arise, the Athletic Trainer should consult the team Physician.
 - ii. It is recommended that baseline testing be completed biennially for student-athletes ages 13 and older and annually for student-athletes 12 and under.
 - iii. If a student-athlete sustains a concussion, the student-athlete should repeat baseline testing the following academic year. In some cases, it may be indicated to use the most-recent post-injury test following injury as the new baseline as outlined by the treating Physician or team Physician.

- b. Certain circumstances (i.e., Learning disabilities, colorblindness, etc.) may require modification to baseline testing, specifically including a VOMS assessment. Any concerns should be addressed with the team Physician.
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 activity. 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 / Strength and Conditioning 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 are required to complete a PA Department of Health approved concussion management certification course.⁵
3. Coaches are highly encouraged to attend annual informational meetings on concussion.
4. Coaches should encourage a culture of reporting injury and illness, including concussion.
5. Coaches should teach proper techniques to reduce the risk of head injury.
6. All headgear must be certified by the appropriate governing organization and fitted by a designated person that has appropriate knowledge of equipment fitting.^{6,7}
7. Emerging research recommends that Coaches and Strength and Conditioning coaches develop neuromuscular training warm-up programs aimed to reduce concussion rates and potential other sport related injuries.²

Parents/Guardians

1. Parents/Guardians 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.
2. Parents are highly encouraged to attend annual informational meetings on concussion.

School Administrators

1. Administrators should be provided with a copy of the concussion policy.
 - a. Administrators should promote a culture of reporting injury and illness, including concussion, and fair play amongst coaching staff.
2. Administrators are responsible for confirming that all coaches have completed the PA Department of Health approved concussion management certification course.

School Nurse

1. The School Nurse should be provided with a copy of the concussion policy. This policy may be shared with other members of the school concussion management team.

SECTION III: MANAGEMENT

Step 1: Acute Management

1. Any student-athlete who exhibits any signs and/or symptoms of a concussion while participating in a school sponsored or Network related athletic events will be removed from activity for the day and shall not return or perform activities that may increase the severity or trigger signs and/or symptoms.
 - a. Signs that warrant immediate removal from the field include actual or suspected loss of consciousness, seizure, tonic posturing, ataxia, poor balance, confusion, behavioral changes and amnesia²

2. 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.
 - i. Short of a multimodal evaluation of symptoms, signs, balance, gait, neurological and cognitive changes associated with a potential concussion may be inadequate to allow continued sports participation.
 - b. At a minimum the SLUHN Sideline Concussion Assessment should be performed for an immediate assessment following injury, minimum 15 min post injury. (Addendum 6).
 - c. If warranted, based on result of SLUHN Sideline Concussion Assessment, an evaluation consisting of a multimodal screen (SCAT6) should be used as a more thorough clinical assessment, completed at best availability of the athletic trainer prior to the individual being released from medical care (going home, leaving venue or facility).
 - i. Child SCAT6 should be utilized when evaluating student-athletes ages 8-12 years of age.
 - ii. SCAT6 should be utilized when evaluating student-athletes ages 13 and above.
 - iii. It is recommended that the examination be performed in a **distraction-free** zone whenever possible.
 - iv. It is strongly advised to allow an adequate evaluation that takes at least 10-15 min and an adequate accommodation for an off-field assessment free of the pressures and scrutiny of match play
3. **After an acute examination by the Team Physician or Athletic Trainer using a multimodal assessment, a student-athlete who presents with concussion-like signs and/or symptoms shall be excluded from participation for the remainder of the day.**
4. **Return to participation on the same day may be allowed following multimodal assessment by Team Physician and/or Athletic Trainer determine that no concussion has occurred, and the student-athlete is otherwise in good health.**
5. Any student-athlete who is seen in the Emergency Department or at an Urgent Care facility for concussion-like symptoms must follow up and receive clearance from a Physician trained in the management of a concussion prior to beginning the return-to-sport protocol.
 - a. If red flags are present, the student-athlete should be transported to the Emergency Department. If no red flags are present, the athlete should schedule an appointment with a Physician trained in the management of concussion as stated later in this policy. It is not recommended to follow-up with Urgent Care for the treatment or clearance from head injury.
6. The Athletic Trainer must contact the student-athlete's parent or guardian if he or she is exhibiting any signs and/or symptoms of a concussion or other brain injury.
 - a. Written at home and school instructions will be given to the student-athlete's parent or guardian (ie. Addendum 3).
7. 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

1. Following recognition of a suspected concussion, the Athletic Trainer should perform serial monitoring every 15-20 minutes for signs of cognitive or neurological deterioration.
2. 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
 - l. Unusual behavior, increased confusion, restlessness or agitation.
3. 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, such as the last page of the SCAT6, CDC references, additional school or Network handouts (ie. Addendum 3).
 4. Student-athletes with a suspected concussion shall be withheld from all physical activity until cleared by a Physician trained in the management of concussion.
 - a. The only exception is symptom-limited aerobic non-contact, low risk physical activity as tolerable at the Athletic Trainer's discretion after the first 48-hours post-injury.

Step 3: Plan of Care

1. The student-athlete will be referred to a Physician trained in the evaluation and management of concussions.
 - a. The Athletic Trainer will help to facilitate this appointment with a St. Luke's concussion specialist if scheduling an appointment within the St. Luke's Network. If treated out-of-network the parent should facilitate this appointment with the Physician's office.
 - i. If treated by a Physician in the St. Luke's Network:
 1. Student-Athletes ages 9 to 25 will be referred directly to Sports Medicine for evaluation.
 2. Student-Athletes ages 8 and under will be referred to Pediatric Neurology.
 - ii. If treated by a Physician out-of-network, the Physician should be trained in the management of sport-related concussion and clearance notes must be provided to the Athletic Trainer.
 1. If any questions or concerns arise, the final decision to return-to-sport is at the team Physician's discretion. Outside notes will not override the team Physician's decision.
 - b. The Physician will make return to school recommendations and articulate this with the student-athlete, parent/guardian, School Nurse, and Athletic Trainer.
2. The Athletic Trainer will be responsible for notifying coaches of the student-athlete's concussion and will be updated regularly on their appropriate level of participation.
3. The student-athlete will be instructed to check in with the Athletic Trainer daily and if applicable the School Nurse.
 - 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.
4. Based on Physician clinical judgement, a referral to Physical Therapy may be warranted for symptomatic student-athletes.

- a. The Athletic Trainer should consult with the treating Physician and/or physical therapist to determine if additional rehabilitation is warranted to be performed by the Athletic Trainer.
 - b. Cervicovestibular rehabilitation is recommended if dizziness, neck pain and/or headaches persist for more than 10 days.
 - i. If warranted and after consultation with supervising physician, the Athletic Trainer may perform rehabilitation techniques. Examples listed on Addendum 7.
 - c. If symptoms persists beyond 4 weeks in children and adolescents, active rehabilitation and collaborative care may be of benefit.
5. The Physician may establish a post-concussive (neuropsychological [ImPACT®], vestibular, ocular, cognitive) testing timeline.
- a. Post-Injury ImPACT testing procedures for Student-Athletes treated by St. Luke's Primary Care Sports Medicine Physicians:
 - b. The first post-Injury ImPACT test will be completed at minimum 48 hours or on the second day post head injury.
 - i. The ImPACT clinical report will be extracted from ImPACT with baseline comparative scores and post-injury scores and be uploaded into EPIC as an attachment to the initial injury evaluation note.
 - c. The treating St. Luke's Physician will establish subsequent post-injury ImPACT testing timeline between appointments.
 - d. A subsequent post-injury ImPACT test will be completed prior to Step 4 of the graduated return-to-sport protocol.
 - i. Athletes may take the post-injury test prior to activity during this stage or the following day (ie. weekend).
 - ii. The post-injury ImPACT test at Step 4 will be extracted from ImPACT with all baseline and post-injury scores and attached to EPIC progress note for Physician to review for final clearance. The Athletic Trainer is responsible to notify the St. Luke's Physician the updated clinical report is ready for review. The St. Luke's Physician shall put an updated clearance note in the student-athletes EPIC chart.
 - e. Post-Injury ImPACT tests MUST be completed in person under the supervision of an Athletic Trainer or designee.

Step 4: Return-to-Learn (RTL): Secondary School

1. Facilitating RTL is a vital part of the recovery process for student-athletes health care providers should work with stakeholders on education and school policies to facilitate academic support, including accommodations/learning adjustments for students with sport related concussion when needed².
2. To minimize academic and social disruptions during the RTL strategy, health care providers should avoid recommending complete rest and isolation, even for the initial 24–48 hours, and instead recommend a period of relative rest. However, in certain circumstances, complete rest may be advised.
 - a. Relative rest includes activities of daily living and reduced screen time
3. For student athletes with sport-related concussion, it is recommended to follow the Amsterdam Consensus Statement from the 6th International Congress on Concussion in Sport.
 - a. **STEP 1:** Daily activities that do not result in more than a mild exacerbation* of symptoms related to the current concussion: Typical activities during the day (eg, reading) while minimizing screentime. Start with 5–15 min at a time and increase gradually.
 - b. **STEP 2:** School Activities: Homework, reading or other cognitive activities outside of the classroom.

- c. **STEP 3:** Return to school part time: Gradual introduction of schoolwork. May need to start with a partial school day or with greater access to rest breaks during the day.
- d. **STEP 4:** Return to school full time: Gradually progress in school activities until a full day can be tolerated without more than mild* symptom exacerbation.

*Mild and brief exacerbation of symptoms is defined as an increase of no more than 2 points on a 0–10 point scale (with 0 representing no symptoms and 10 the worst symptoms imaginable) for less than an hour when compared with the baseline value reported prior to cognitive activity.

4. The Athletic Trainer and Parent/Guardian will work together to ensure the School Nurse is notified once concussion is suspected (see Addendum 3 for an example).
 - a. If the injury occurred outside of a St. Luke’s affiliated school district (ie. Youth event), the parent/guardian will be responsible to notify the School Nurse of the suspected concussion. The Athletic Trainer should inform the parent/guardian that the School Nurse should be notified in cases of a suspected concussion.
 - b. The school’s concussion management team, including but not limited to the School Nurse and Guidance Counselor, will work collaboratively to notify the appropriate teachers of the student-athlete’s concussion, and possible academic support.
 - c. In the case of a student-athlete returning to the classroom prior to seeing a Physician, the school may choose to implement academic adjustments prior to receiving Physician orders as seen fit.
 - d. The Physician may provide academic accommodations, including a stepwise approach to return-to-learn. Receipt of Physician notes to the Athletic Trainer or Parent/Guardian should be provided to the School Nurse.
 - i. The Physician may recommend performing school activities that do not worsen symptoms (symptom-limited activity).
 - e. Examples of academic support include but are not limited to:
 - i. Take rest breaks as needed.
 - ii. Progress the number of hours in school (shortened school day)
 - iii. Be given more time to take tests or complete assignments. (All courses should be considered)
 - iv. Receive help with schoolwork (e.g., pre-teaching, outlines, note-taker)
 - v. Reduce time spent on the computer, reading, and writing.
 - vi. Be granted early dismissal from each class to avoid crowded hallways.
 - vii. No standardized testing (e.g., PSSA, SAT) until cleared by treating Physician.
 - viii. No band or chorus activities.
5. BrainSTEPS has created a list of academic adjustments that can be referenced for students in remote online learning that can be found here: https://www.brainsteps.net/_corbs/about/BrainSTEPS.AdjustmentsOnline.Learning.pdf.
6. Students with persistent symptoms (greater than 4 weeks) and who require assistance to be able to participate fully in school, may be candidates for a 504 plan. A 504 plan will describe modifications and accommodations to help a student return to pre-concussion performance levels. For example, a student recovering from a concussion might receive environmental adaptations, temporary curriculum modifications, and behavioral strategies.¹⁰
7. 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-learn after a brain injury. These teams work with all parties to identify and implement appropriate academic support 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. 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).

Step 5: Return to Sport

1. Return-to-sport depends on several factors:
 - a. Student-athletes should not return-to-sport until they have successfully returned to academics.
 - i. Early introduction of symptom-limited aerobic non-contact, low risk physical activity as tolerable may be appropriate following concussion (ie. Walking, stationary biking). This may be implemented at the Athletic Trainer's discretion unless there is a contraindication. This is meant to aid in the rehabilitation of concussion and is separate from the return-to-sport progression.¹²
 - b. Physical exam
 - c. Graded concussion symptom checklist
 - d. History of concussion or other brain injury
 - e. Neuropsychological (ie. ImPACT, SCAT6, etc.) testing scores
 - f. Recommendations of the St. Luke's medical staff, treating Physician, and/or district Athletic Trainer.
2. The student-athlete must meet ALL of the following criteria to return-to-sport.
 - a. Asymptomatic at rest, in the classroom, and with exertion.
 - b. At minimum, ImPACT[®] scores, and/or other neurological testing scores (when indicated) comparable to baseline and reviewed by the treating Physician 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-sport.
 - ii. Notes from Neurologists and Neuropsychologists may override this policy. If there is a difference in return to play, the final decision would be made after a discussion between Athletic Trainer, team physician and Neurologist/Neuropsychologist
 - iii. 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.***

3. Progression through the return-to-sport 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, the St. Luke's Sports Medicine Team and/or the treating Physician.
 - a. If an athlete returns to play after the typical sport concussion timeline of 2-4 weeks in adolescents 13 and older or 4-6 weeks in children 12 and younger, the athlete may have secondary symptoms that may be a result of being withheld from their sport and normal activities. In these instances, the Athletic Trainer should consult with the treating Physician, team Physician, or neurologist to determine the appropriate progression and red flags that may limit progression.
4. A graduated return-to-sport 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 to the treating Physician for re-evaluation.
- c. If the student-athlete remains at the same step of the graduated return-to-sport protocol for three days, the athlete should be referred to the treating Physician for re-evaluation.

5. St. Luke's utilizes the Amsterdam Consensus Statement from the 6th International Congress on Concussion in Sport² (Each step requiring a minimum of 24-hours):

Steps 1-2B may begin prior to physician appointment for initial evaluation of concussion symptoms if the activity does not exacerbate the athletes symptoms by more than 2 points on a symptom scale and should not be elevated for more than 1-2 hours after activity as reported by the athlete before and after activity. Managing schoolwork and school-related activities is a joint effort between the school and student-athlete that falls outside of this policy. If any questions or concerns arise, the Athletic Trainer should consult the treating Physician

- a. **STEP 1: Symptom Limited Activity:** Off medication, for a 24-hour period while completing daily activities that do not exacerbate symptoms (eg, walking) and gradual reintroduction of work/school. If no exacerbation of symptoms, progress to next step
- b. **STEP 2: Aerobic exercise** Stationary cycling or walking at slow to medium pace. May start light resistance training that does not result in more than mild and brief exacerbation* of concussion symptoms. Goal is to increase heart rate.
 - i. **2A-Light** up to approximately 55% maxHR If no exacerbation of symptoms **THEN** progress to next step
 - ii. **2B-Moderate** (up to approximately 70% maxHR, If no exacerbation of symptoms, progress to next step if physician clearance has been provided:

Prior to Step 3, the athlete must be evaluated by a physician trained in the management of concussion and ,at minimum, receive clearance to participate in Step 3 and Step 4. Athletes treated at St. Luke's will obtain a second clearance prior to Step 5: Full Contact Practice.

- c. **STEP 3: Individual Sport specific Exercise**, Sport-specific training away from the team environment (eg, running, change of direction and/or individual training drills away from the team environment). No activities at risk of head impact. The objective is to add movement while continuing to increase heart rate. If no return of symptoms, progress to next step:

Steps 4–6 should begin after the resolution of any symptoms, abnormalities in cognitive function and any other clinical findings related to the current concussion, including with and after physical exertion. **A post-injury IMPACT test shall be completed at Step 4 prior to final written clearance to begin Step 5 by treating physician as outlined in Section III, Step 3.**

- d. **STEP 4: Non-contact training drills:** Exercise to high intensity including more challenging training drills (eg, passing drills, multiplayer training) can integrate into a

team environment. Resume usual intensity of exercise, coordination and increased thinking. If no return of symptoms, progress to next step:

- e. **STEP 5: Written clearance from treating physician prior to Step 5; Full Contact Practice;** participate in normal practice and 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. **STEP 6: Full Return-to-sport;** and competition following that the athlete has successfully completed the return-to-sport protocol.
6. If symptoms persist and unable to complete return-to-learn or return-to-sport protocols follow-up care should be initiated with collaboration with treating Physician. Referral may be warranted to Physical Therapy, Neurology, or other concussion-trained specialist.
- a. For High School and Middle School student-athletes with persistent symptoms greater than 4 weeks that persist significantly with conservative treatment, a referral to Neurology may be warranted as determined by the treating Physician.

IV. Documentation

1. Each St. Luke's affiliated Athletic Trainer will document at minimum, in their respective EMR system, the following information:
 - a. All initial encounters by the Athletic Trainer for the assessment of concussion.
 - b. All neuropsychological testing (ie. ImPACT, SCAT6, VOMS, BESS, etc.) including baseline comparatives.
 - c. All initial Physician referrals and evaluation with any provided office notes.
 - d. Daily progress notes and daily graded symptom checklists.
 - e. Notes by the overseeing Physician for any academic accommodations.
 - f. Clearance by the overseeing Physician to start the supervised progression through the return-to-play protocol should be documented in the progress note in the EMR. Notes from outside of St. Luke's should be scanned into the EMR
 - g. Documentation of each stage of the return to sport protocol, activities performed and athlete status at each stage.
 - h. Clearance by the overseeing Physician for unrestricted return-to-sport should be documented in the progress note in the EMR. Notes from outside of St. Luke's should be scanned into the EMR.
 - i. Documentation that post-concussion plan of care was communicated to both the student-athlete and another adult responsible for the student-athlete, in oral and/or written form (ie. Addendum 3).
2. St. Luke's affiliated Athletic Trainers will communicate a suspected concussion with the school nurse and appropriate guidance counselor. The St. Luke's affiliated Athletic Trainer will provide updated school and sport doctor notes to the school nurse at their earliest convenience upon receipt. The school nurse will also be informed after successful completion of the return to sport progression. Communication with the school nurse should also be documented in the respective EMR system.

V. Disclaimer Statement

1. This policy and procedure are intended to provide a description of a course of action to comply with legal requirements and/or operational standards. There may be specific circumstances not contemplated by this policy and procedure that may make compliance either unclear or inappropriate. For advice in these circumstances, consult with your Chain of Command, Administrator on Call, Clinical Risk Management, Legal Services, Accreditation and Standards, or Compliance Officer, as appropriate.

VI. References

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

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5. ImPACT Testing & Computerized Neurocognitive Assessment Tools. <https://www.impacttest.com/>. Accessed December 1, 2017.
6. Requirements to Coach in PIAA Member Schools Information. <http://www.piaa.org/news/details.aspx?ID=2924>. Accessed December 1, 2017.
7. NOCSAE | National Operating Committee on Standards for Athletic Equipment. <http://nocsae.org/>. Accessed December 1, 2017.
8. NOCSAE Statement Regarding Add-on Helmet Products - PIAA. <http://www.piaa.org/news/details.aspx?ID=2998>. Accessed December 1, 2017.
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VI. Attachments

Addendum 1a



**Concussion Policy Acknowledge Form
Athlete & Parent/Guardian**

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

Student-Athlete Name Printed: _____ Sport: _____

Student-Athlete Signature: _____ Date ____ / ____ / ____

Parent/Guardian Name Printed: _____ Relationship: _____

Parent/Guardian Signature: _____ Date ____ / ____ / ____

Addendum 1b



**Concussion Policy Acknowledge Form
Coach**

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

Coach Name Printed: _____ Sport: _____

Coach Signature: _____ Date ____ / ____ / ____

Coach Name Printed: _____ Sport: _____

Coach Signature: _____ Date ____ / ____ / ____

Coach Name Printed: _____ Sport: _____

Coach Signature: _____ Date ____ / ____ / ____

Coach Name Printed: _____ Sport: _____

Coach Signature: _____ Date ____ / ____ / ____

Coach Name Printed: _____ Sport: _____

Coach Signature: _____ Date ____ / ____ / ____

Addendum 1c
Concussion Policy Acknowledge Form
Athletic Trainer, Athletic Director, Team Physician

Compliance Certification

Academic Year: _____

School District/Organization: _____

Concussion Management Plan

By signing and dating this form, I hereby acknowledge, on behalf of the institution identified above, that for the 20 academic year, the attached St. Luke's Sports Medicine Concussion Policy is consistent with state concussion requirements. I acknowledge that I have received and reviewed the St. Luke's Sports Medicine Concussion Policy.

Required Signatures**

Director of Athletics

Print Name:

Title:

Sign:

Date:

Team Physician

Print Name:

Title:

Sign:

Date:

Athletic Trainer

Print Name:

Title:

Sign:

Date:

Athletic Trainer

Print Name:

Title:

Sign:

Date:

Athletic Trainer

Print Name:

Title:

Sign:

Date:

Athletic Trainer

Print Name:

Title:

Sign:

Date:

Athletic Trainer

Print Name:

Title:

Sign:

Date:

Athletic Trainer

Print Name:

Title:

Sign:

Date:

Addendum 2

AT-HOME CONCUSSION ImPACT BASELINE TESTING EXPLANATION AND INSTRUCTIONS

As part of the concussion evaluation, St. Luke's University Health Network uses a computerized assessment measure called ImPACT (Immediate Post-Concussion Assessment and Cognitive Testing) to aid in the clinical decision-making process. ImPACT is a computerized neuropsychological assessment of memory, attention, reaction time, processing speed, and post-concussion symptoms. ImPACT provides specific, objective information regarding the injury. ImPACT is only one tool in the multidisciplinary approach to the concussion evaluation. To properly assess post-injury ImPACT results, a baseline ImPACT test must be on file. These tests are regarded as privileged medical information and results are not shared with anyone besides the medical staff, unless requested by your child's treating Physician.

AT HOME BASELINE TESTING

The test takes approximately 30-40 minutes to complete. If your school/organization is performing at home ImPACT testing, please read the instructions carefully, as the validity of the ImPACT test depends on them. If you have any questions or need further instruction, please reach out to your Athletic Trainer.

REMINDERS

When taking the ImPACT baseline test, the environment should be similar to how the athlete would take a post-injury test, should a concussion be suspected or need to be ruled out. To help create this standardization, please follow these instructions:

1. The test should be taken in a quiet, distraction-free environment. This means no earbuds, no cellphone use, etc... during the test.
2. The test should be taken on a computer. If taken on a laptop, do not use the trackpad, instead, PLEASE USE THE MOUSE.
3. Be sure to have a secure internet/WIFI connection.
4. If applicable, the test should be completed before any strenuous exercise or at least 3 hours after strenuous exercise.

If your code will not work, enable pop-ups on your browser. If your test freezes for more than one minute, try refreshing your page. If this does not work, you will have to restart the test. If you do not have a strong WIFI connection, consider using an Ethernet cable or taking the test on a desktop if possible. If a baseline test is deemed invalid, the Athletic Trainer will have the athlete retake the test.

Part of the test relies on seeing colors. If your child has a color vision deficiency or color blindness and you think it will alter the results of the test, please email the Athletic Trainers, as we use an alternate baseline concussion test.

STARTING THE ImPACT TEST

1. Open your browser, enter the website: www.impacttestonline.com/testing
2. Contact your St. Luke's Athletic Trainer for your school/organization's access code.
3. Click **VALIDATE**
4. Click the box **SELECT AN ORGANIZATION** and scroll down until you see the name of your school/organization.
5. Click **LAUNCH BASELINE TEST**
6. The test has now started.
 1. When you get to the slide that asks if you would like to skip or enter demographic, click **ENTER DEMOGRAPHICS**.
 2. Give your best answer for CURRENT POSITION/EVENT/CLASS (ie. point guard in basketball, swimming event(s), flyer/base in cheer, wrestling weight class).

WHEN YOU HAVE FINISHED THE TEST

1. You will see a screen with your information on it and a spot on the bottom to enter your email.
2. Enter an email you have access to. That email will get a copy of the athlete's passport ID.
3. The screen will not change, simply close the browser.

Any questions can be directed to your Athletic Trainer.

Addendum 3



The Sports Medicine Department would like to inform you that _____ sustained a concussion on ___ / ___ / ___. The student-athlete will undergo continued follow-up/testing with the Sports Medicine department. The above student-athlete is awaiting an appointment with a Physician. Formal academic accommodations may be given to the student athlete by treating Physician and those will be forwarded to you when available.

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 may be attending class, please be aware that the side effects of the concussion may adversely impact 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.

A concussion can cause a variety of physical, cognitive, and emotional symptoms. Concussions range in significance from minor to major, but they all share one common factor — temporary functional disturbance that could affect academic performance. We would like to inform you that during the next few weeks this student-athlete may experience one or more of these signs and symptoms:

- Headache
- Dizziness
- Light Sensitivity
- Blurred Vision
- Difficulty Concentrating
- Nausea
- Diplopia - Double Vision
- Difficulty Sleeping
- Feeling Sluggish or Groggy
- Balance Problems
- Confusion
- Noise Sensitivity
- Memory Problems

Student-Athlete

Signature

Date

Parent/Guardian

Signature

Date

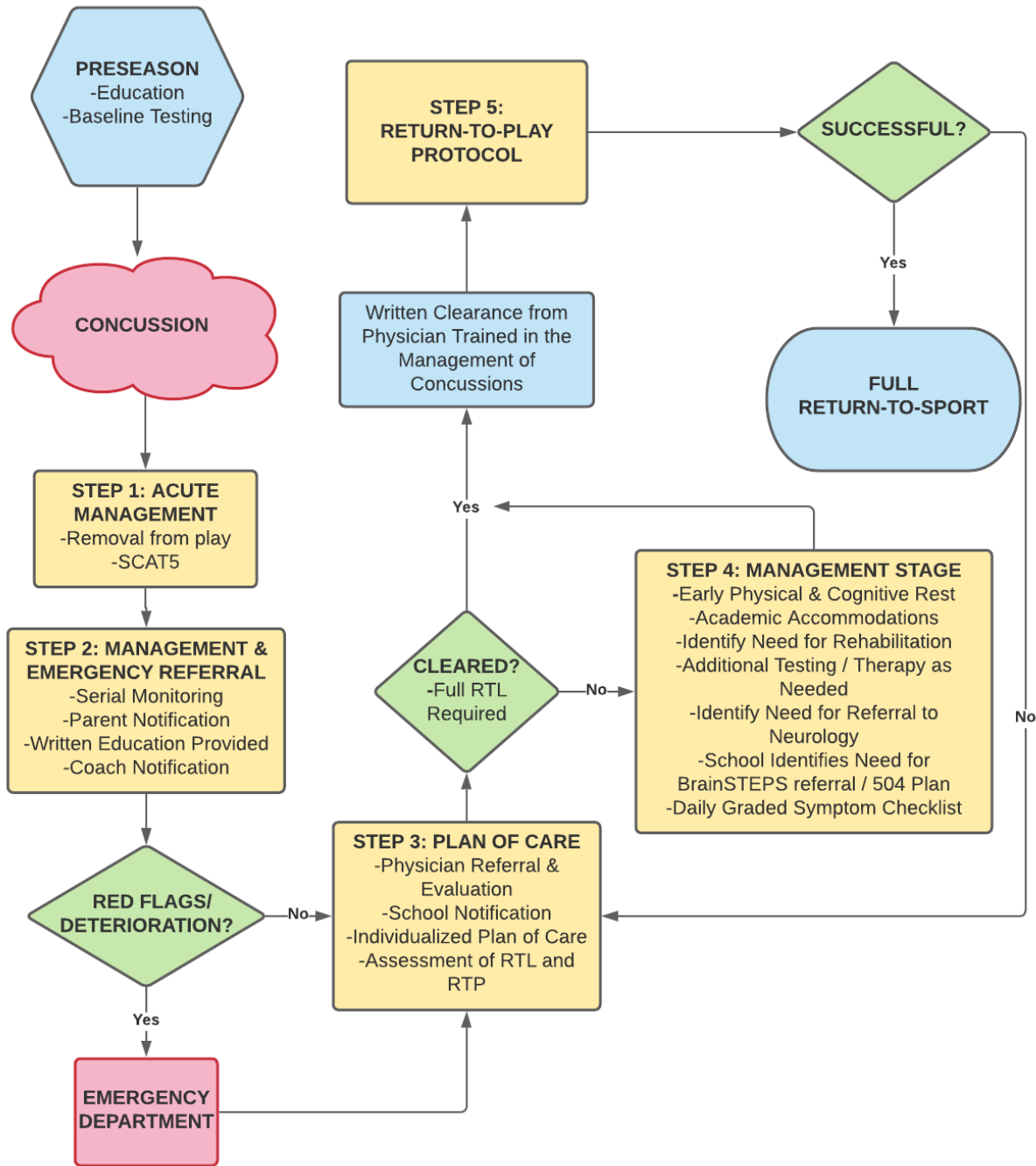
Healthcare Provider

Signature

Date

Addendum 4

Concussion Synopsis

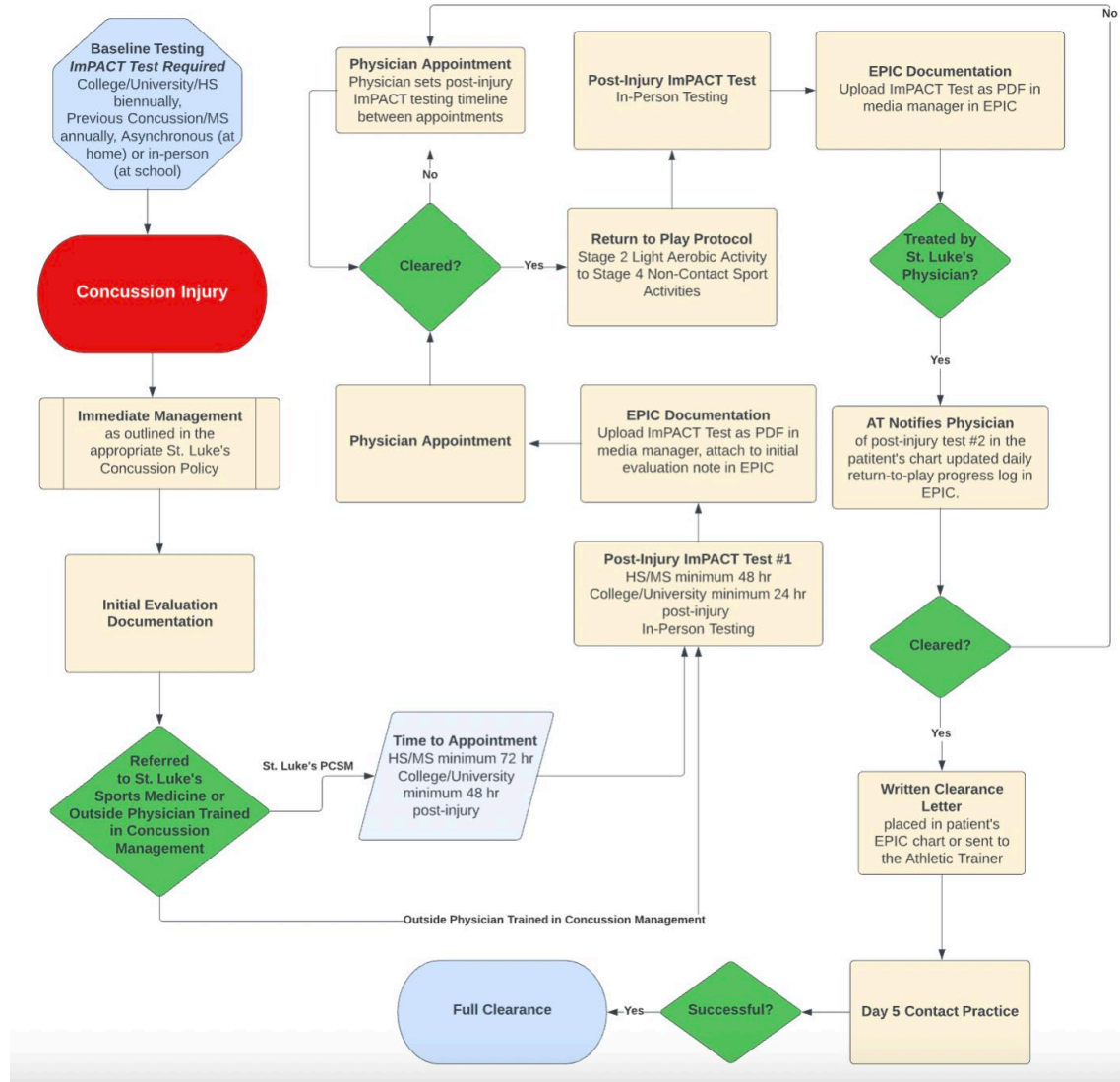


* Effective concussion management begins well before the injury occurs. During the preseason, trained staff from St. Luke's Sports Medicine facilitates educational seminars for athletes, parents, coaches, and Athletic Trainers.

* St. Luke's collaborates with parents, coaches, Athletic Trainers, and School Nurses to effectively manage the concussion until the athlete can be safely returned to full physical and cognitive activity.

Addendum 5

ImPACT Baseline and Post-Injury Guidelines for Athletes Treated by St. Luke's Primary Care Sports Medicine Physicians



***DISCLAIMER:** The purpose of this flowchart is to demonstrate expected ImPACT testing timelines and the expectation of attaching the ImPACT clinical report to the EPIC encounter. This flowchart does not replace a SCAT6, Graded Symptom Checklist, VOMS, BESS, etc. nor documentation procedures outlined in the St. Luke's Sports Medicine Concussion Policy. If you have a case that does not fit within this flow chart or have any questions/concerns, please reach out to your team Physician for further direction.

Addendum 6 - SLUHN Concussion Sideline Assessment

Athlete Name: _____
 DOB: _____
 School: _____
 Grade: _____
 Examiner: _____
 DOI: _____



Recognize and Remove

Red Flags: Call and Ambulance

If ANY of the following signs are observed or complaints are reported after an impact to the head or body, the athlete should be immediately removed from play/game/activity and transported for urgent medical care by a healthcare professional.

- Neck pain or tenderness
- Seizure, 'fits', or convulsion
- Loss of vision or double vision
- Loss of consciousness
- Increased confusion or deteriorating conscious state (becoming less responsive, drowsy)
- Weakness or numbness/tingling in more than one arm or leg
- Repeated vomiting
- Severe or increasing headache
- Increasingly restless, agitated or combative
- Visible deformity of the skull

If there are no Red Flags, identification of possible concussion should proceed as follows:

Concussion should be suspected after an impact to the head or body when the athlete seems different than usual. Such changes include the presence of any one or more of the following: visible clues of concussion, signs and symptoms (such as headache or unsteadiness), impaired brain function (confusion), or unusual behavior.

History

Mechanism: _____

Visible Clues of Suspected Concussion

- Loss of consciousness or responsiveness
- Lying motionless on the playing surface
- Falling unprotected to the playing surface
- Disorientation or confusion, staring or limited responsiveness, or an inability to respond appropriately to questions
- Dazed, blank, or vacant look
- Seizure, 'fits', or convulsions
- Slow to get up after a direct or indirect hit to the head
- Unsteady on feet/balance problem or falling over/poor coordination/wobbly
- Facial injury

Symptoms: Ask patient if they have any of the following symptoms.

Physical Symptoms		
Headache	Yes	No
"Pressure in head"	Yes	No
Balance problems	Yes	No
Nausea or vomiting	Yes	No
Drowsiness	Yes	No
Dizziness	Yes	No
Blurred vision	Yes	No
More sensitive to light	Yes	No
More sensitive to noise	Yes	No
Fatigue or low energy	Yes	No
"Don't feel right"	Yes	No
Neck pain	Yes	No

Changes in Emotions		
More emotional	Yes	No
More irritable	Yes	No
Sadness	Yes	No
Nervous or anxious	Yes	No

Changes in Thinking		
Difficulty concentrating	Yes	No
Difficulty remembering	Yes	No
Feeling slowed down	Yes	No
Feeling like "in a fog"	Yes	No

Addendum 7

Examples of Rehabilitation Techniques

EYE EXERCISES - 8

Gaze Stabilization: Tip Card

1. Target must remain in focus, not blurry, and appear stationary while head is in motion.
2. Perform exercise with small head movement (45° to either side of midline).
3. Speed of head motion should be increased as long as target remains in focus.
4. If you use glasses, wear them while performing exercises.
5. These exercises may provoke symptoms of dizziness or nausea. Work through these symptoms. If too dizzy, slow head movement down slightly. Rest between each exercise.
6. Exercises demand concentration, avoid distractions.
7. For safety, standing exercises must be performed close to a counter or next to someone.

EYE EXERCISES - 2

Movements: Head / Eyes (Pictorial Reference)

Tilt head down 15-30 degrees. Eyes fixed on target, head moves opposite direction of moving target.



Eyes fixed on target, head moves same direction as moving target.

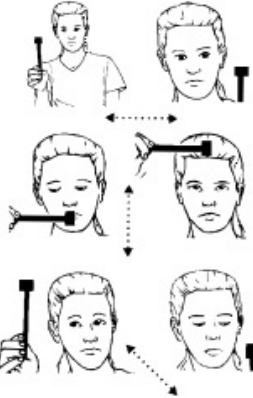


Therapist: Use this card with Eye Exercises 3 and 4.

EYE EXERCISES - 5

Oculomotor: Smooth Pursuits

Holding a single target, keep eyes fixed on target. Slowly move it side to side while head stays still. Move _____ seconds each direction.



Perform in _____ position.
Repeat _____ times per session.
Do _____ sessions per day.

EYE EXERCISES - 6

Oculomotor: Saccades

Holding two stationary targets placed _____ inches apart side to side, move eyes quickly from target to target as head stays still. Move _____ seconds each direction.



Perform in _____ position.
Repeat _____ times per session.
Do _____ sessions per day.

EYE EXERCISES

Vergence Exercises - Pencil Push-Ups

Goal: Pencil Tip within 2 to 3 cm of the nose

Procedure:

- Hold a pencil at arm's length directly between your eyes
- Slowly move the pencil towards your nose
- Continue moving the pencil slowly towards your nose.
- When the pencil is no longer single, stop moving the pencil and return it back to one.
- Once pencil is one again, move it closer to your nose.
- If unable to return to one pencil starts over at step 2.
- Perform 20 push-ups. Total of 3 sets of 20 reps.
- Last rep of each set measure the distance (cm) of the pencil tip to the nose.

1



3



EYE EXERCISES

Vergence Exercises - Brock String

Goal: Build Stamina

Procedure:

- 6-foot string, taugt
- One end held at eye level; other end held at the tip of the nose.
- Cue to focus on one bead – Great for Feedback
- Should see one bead but two strings
- If one eye "shuts off" or is covered, only one string is seen.

Progression Level 1: Beads together at end

Progression Level 2: Beads evenly distributed across string



Examples of Rehabilitation Techniques

GAIT - 3

Up / Down Head Motion

Walking on solid surface with head and eyes positioned straight ahead, move head and eyes toward ceiling for _____ steps. Return with head and eyes straight ahead. Repeat, moving head and eyes toward floor. Maintain a straight path and postural control throughout activity.

Repeat sequence _____ times.

Do _____ sessions per day.

___ Repeat while at mall or grocery store.



GAIT - 13

Forward Progression With 360° (Full) Turns

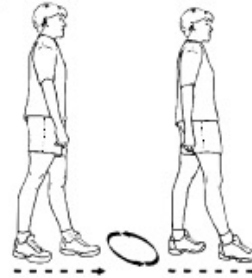
On solid ground, walk making a slow full turn in place, leading with head and eyes, toward the right every _____ steps while continuing on a straight path forward between turns.

Repeat sequence _____ times.

Do _____ sessions per day.

___ Repeat with eyes closed.

___ Repeat on _____ surface.



EYE EXERCISES - 18

Gaze Stabilization: Walking Toward Target

Keeping eyes fixed on a single stationary target, walk toward target placed on wall _____ feet away at eye level, moving head up and down for _____ seconds. Repeat with head tilted down 15-30 degrees, moving head side to side for _____ seconds.

Repeat sequence _____ times per session.

Do _____ sessions per day.

___ Repeat using full field stimulus _____



GAIT - 2

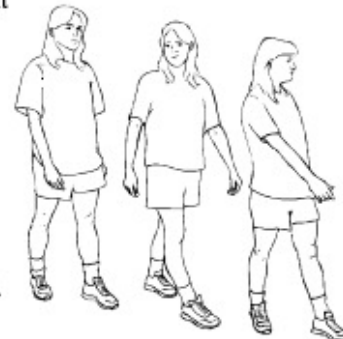
Side to Side Head Motion

Walking on solid surface with head and eyes straight ahead, turn head and eyes toward right for _____ steps. Return with head and eyes straight ahead. Repeat, turning head and eyes to other side.

Repeat sequence _____ times.

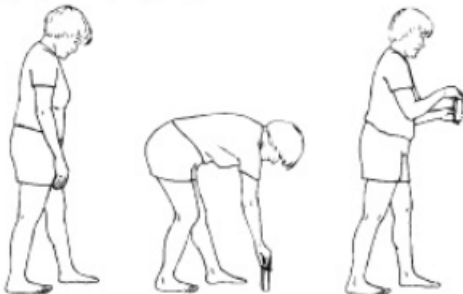
Do _____ sessions per day.

___ Repeat while at mall or grocery store.



GAIT - 18

Picking Up / Carrying Object



While walking, pick up _____ and carry for _____ feet. Return object to the floor.

Repeat sequence _____ times per session. Do _____ sessions per day.

GAIT - 20

Figure Eight

Walk making a figure eight pattern.

Repeat _____ times per session.

Do _____ sessions per day.

___ Repeat with eyes closed.

___ Repeat on _____ surface.

