Bloomsburg University
Concussion Management Policy

Updated 8/1/2018

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POLICY STATEMENT: This document outlines procedures to assist in the management of concussions and the safe return-to-play for student-athletes at Bloomsburg University. ***NOTE: A multifaceted approach to concussion management is suggested. As a result, the information provided by this protocol and the tools it references should be taken into consideration on a case-by-case basis. Therefore, in certain cases, modifications to this protocol may be deemed appropriate by the athletic training staff and/or team physicians.*

PURPOSE: To develop an articulate and thorough method for the recognition, evaluation, and management of student-athletes who have sustained a concussion. More specifically, to:

a) ensure the proper diagnosis and management of concussions;
b) prevent second-impact syndrome, which results when a second concussion is sustained while an individual is still recovering from an earlier concussion and which may cause permanent brain damage or even death; and
c) monitor student-athletes' recuperation in hopes of preventing prolonged recovery or permanent disability.

EVALUATION TOOLS UTILIZED: Including, but not limited to: (a) physical examination; (b) symptom evaluation; (c) neuropsychological testing (ImPact, SCAT 3/SCAT 5); and (d) imaging, if directed by the attending Physician.

DEFINITION: According to the 5th international Conference on Concussion in Sport (Berlin, 2016):

Sport related concussion is a traumatic brain injury induced by biomechanical forces. Several common features that may be utilised 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 (eg, psychological factors or coexisting medical conditions).

Concussion Education:

Athletic Trainers will be responsible for the coordination of Concussion Education materials, which will be distributed and reviewed with student-athletes and coaches. This must take place at a meeting prior to participation in college athletics.

TIMELINE:

PRE-SEASON

Athletes will be educated on the signs, symptoms, and risks associated with concussions. Prior to the first practice (or the first contact practice), all student-athletes must have a completed baseline assessment on file with the athletic training department. This assessment will include a detailed concussion history as well as neuropsychological and postural-stability testing. All student-athletes will also sign a statement accepting the responsibility of reporting their injuries and illnesses to the athletic training staff.

Education materials:

Materials will be presented to: Coaches, Athletics Administrators, and all Student-Athletes at the beginning of the academic year.

1. CDC & NCAA Concussion Education Handout (See Appendix C) – This provides common signs and symptoms of a concussion, as well as recommendations for student-athletes recovering from concussion.

2. Injury and Illness Reporting Acknowledgement Form (See Appendix D) – Must be reviewed by and signed by all varsity student-athletes. The student-athletes signature on this form acknowledges that they have received a copy of the educational materials outlined above. It is therefore the student-athlete's responsibility to self-report concussive symptoms as well as to report teammates that are suspected of having a concussion based on the information discussed in the educational meeting.

3. Concussion Post-Injury Instruction Form (See Appendix E) – This form will be given to any student-athlete immediately after receiving a concussion. This form gives the student-athlete information on what to expect in the acute stage following their injury as well as instructions for short term management.

4. Return to Learn Policy following concussion (See Page 10) – This process will be mentioned during the educational meeting and will be specifically addressed with any student-athlete recovering from a concussion. This form gives the student-athlete information regarding their injury as well as what they can expect from their healthcare provider.

5. 'Return to Play' and competition following concussion (See Page 12) – This process will be mentioned in the educational meeting but will be specifically addressed with any student-athlete recovering from concussion. It should be noted that the 'Return to Play' procedure is a minimal standard guideline and can be modified by their healthcare provider based on their history, symptoms, etc.

6. Concussion Acknowledgement Form(s) for all stakeholders (See Appendix F, G, H, I) – These forms are reviewed by the coaching staff, athletic director, team physicians and athletic trainers and are

presented by the Director(s) of Sports Medicine & Athletic Training. All groups listed above will be given the CDC & NCAA Concussion Educational Material as well as Bloomsburg University's Concussion Management Policy Manual and asked to review these materials. They will then acknowledge they have received a copy of the 'Concussion Management Policy Manual' and will be expected to report any student-athlete suspected of receiving a concussion. Signature of this document will acknowledge their understanding of the information provided.

Pre-Participation Management:

1. Prevention:
    a. Education:
        Annual education of the student-athletes, coaches, athletic training staff, team physicians, members of the CARE Consortium, and sports administration on the signs, symptoms, diagnosis, and management of concussions is performed by the Sports Medicine staff.
    b. Technique:
        Proper coaching and instruction on safe techniques are paramount to reducing head injury risk in sports. One example of specific instruction in the sport of football is outlined by the Heads Up Tackling™ technique instruction provided by the USA Football organization (See Appendix B).
    c. Maintenance & Inspection of Protective Gear:
        Protective equipment is designed to mitigate injurious forces and reduce overall injury to the student-athlete participating in sport. Regular inspection of protective equipment is performed by athletic training staff and/or equipment staff to ensure equipment deemed necessary for the sport meets performance standards. Properly fitted and maintained protective equipment can reduce the likelihood of head injury.

In an effort to provide the most up-to-date brain health initiatives for student-athletes at Bloomsburg University, we have modified our concussion protocol to include the following assessments in accordance the NCAA/DOD CARE Consortium Research

Annual Baseline

- Demographics - initial completion/updated annually-age, height, weight, sex, year in school, ethnicity, handedness, socio-economic status, sport(s) played, sport position(s), number of years/seasons of exposure for each sport.
- Personal and family history - initial/updated annually-neurological history, concussion history, education, medications, psychiatric/psycho-social history, interest survey.
- Neurocognitive Assessment - ImPact testing.
- Neurological status - Standardized Assessment of Concussion.
- Postural Stability - Balance Error Scoring System (BESS).
- Symptom Checklist - self-reported measures (SCAT 3/SCAT5 and BSI-18).
- Reaction Time - brief measure of reaction-time.

Follow-up- These measures will be repeated when immediate post-concussion testing occurs through several time-points prior to entering the return-to-play protocol.
Team Physician(s) determines pre-participation clearance and/or the need for additional consultation or testing. This includes, but is not limited to neuropsychological consultation, psychiatric/psychological consultation, and diagnostic imaging. Under the current protocol submission each student-athlete that suffers a concussion is assessed at a six-month follow-up time-point.

Recognition, Diagnosis, and Management:

Medical personnel with training in the diagnosis, treatment, and initial management of acute concussion be "present" at all NCAA varsity competitions in the following contact/collision sports: Men's and Women's Basketball, Field Hockey, Football, Women's Lacrosse, Pole Vault, Men's and Women's Soccer, and Wrestling. To be present means to be on site at the campus or arena of competition.

Medical personnel with training in the diagnosis, treatment, and initial management of acute concussion be "available" at all NCAA varsity practices in the following contact/collision sports: Men's and Women's Basketball, Field Hockey, Football, Women's Lacrosse, Pole Vault, Men's and Women's Soccer, and Wrestling. To be available means that, at a minimum, medical personnel can be contacted at any time during the practice via telephone, messaging, email, walkie-talkie, or other immediate communication means. Further, the case can be discussed through such communication, and immediate arrangements can be made for the athlete to be evaluated.

Any student-athlete with signs/symptoms/behaviors consistent with concussion:

- Will be removed from practice or competition
- Will be evaluated by an athletic trainer or team physician with concussion experience
- Will be removed from practice/play for that calendar day if concussion is confirmed

ACUTE / TIME OF INJURY

All student-athletes identified as having a concussion will be held out from participation for the remainder of the day. Final determination of return-to-play is from the team physician or medically qualified physician designee. A student-athlete will not be cleared to return to participation until all signs and symptoms have resolved and the student-athlete has completed a supervised stepwise progression management plan conducted by the athletic trainer.

Acute Evaluation Tools:

- Physical Examination : (SCAT3/SCAT5)
  - Assessment of consciousness
  - Cervical spine trauma, skull fracture, intracranial bleeding
  - Weight bearing, posture, balance
- Neurological status - Standardized Assessment of Concussion and SCAT3/SCAT5.
- Postural Stability - Balance Error Scoring System (mBESS/SCAT3/SCAT5).
- Symptom Checklist - self-reported measures (SCAT3/SCAT5 and BSI-18).
- Reaction Time - brief measure of reaction-time
- Clinical assessment for cervical spine trauma, skull fracture and intracranial bleed will also be performed

Common signs and symptoms of concussion may include, but are not limited to:

SYMPTOMS		
Physical	***Cognitive***	***Emotional***
Headache	Confusion	Irritability
Dizziness	Amnesia	Sadness
Nausea	Disorientation	Nervousness
Balance difficulties	Poor concentration	Depression
Light sensitivity	Memory disturbance	Moodiness
Double vision	Reasoning difficulties	Sleep disturbances
Fatigued		
Feeling dazed, stunned, dinged		
Ringing in the ears		
PHYSICAL SIGNS		
Loss of/Impaired consciousness	Poor coordination or balance	Concussive convulsion
Poor coordination or balance	Slow to answer questions	Seizure
Inappropriate emotions	Vomiting	Slow to follow directions
Vacant stare/Glassy eyed	Slurred speech	Easily distracted, Poor concentration
Inappropriate behavior	Significantly decreased performance	
Personality changes		

The student-athlete will be transported to the emergency room for evaluation and imaging if he/she experiences: (1) prolonged loss of consciousness (>1 minute), (2) significant alteration or deterioration in condition or mental status, (3) an increase in symptoms, or (4) if there is any concern that he/she may have a subdural hematoma.

POST-CONCUSSION FOLLOW-UP

The student-athlete and athletic trainer will complete all previously discuss measures daily, or as needed, to monitor symptoms and recovery.

- Neurocognitive Assessment - ImPact testing.
- Neurological status - Standardized Assessment of Concussion.
- Postural Stability - Balance Error Scoring System (BESS).
- Symptom Checklist - self-reported measures (SCAT 3/SCAT 5 and BSI-18).
- Reaction Time - brief measure of reaction-time

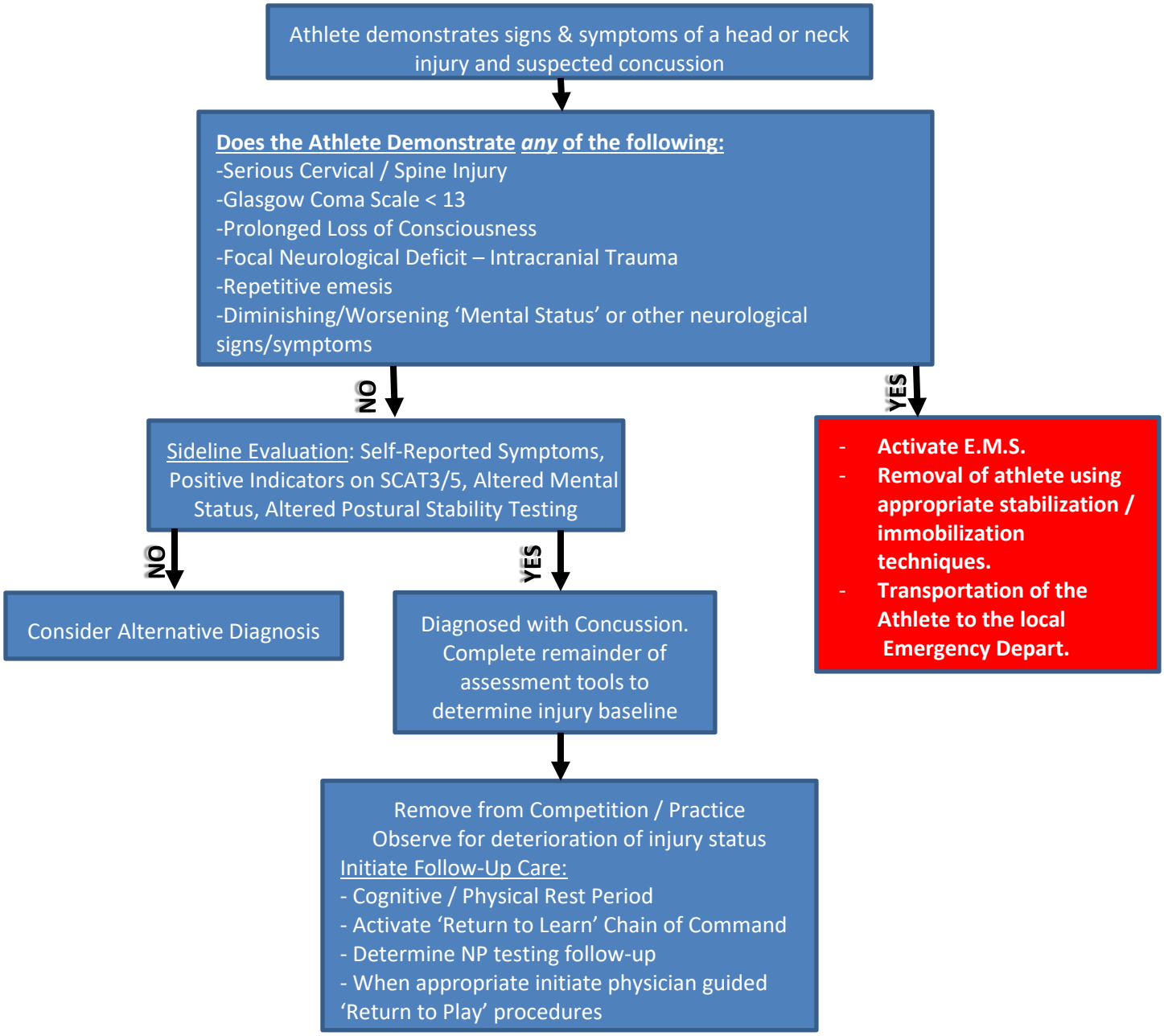
These measures will be done in accordance with the NCAA/DOD CARE Consortium research

Student-athletes should be reminded to abstain from doing any activity that causes symptoms to increase. Other staff/faculty will be notified on an "as needed" basis in order to assist the student-athlete with daily activities until the student-athlete is no longer symptomatic. During the course of the recovery process, the student-athlete will follow-up with a team physician. Final clearance will come from the team physician(s), in accordance with the NCAA/DOD CARE Consortium research.

Post-Concussion Injury Management

Emergency Action Procedures for On / Off Field Recognition and Management:

The supervising sports medicine personnel in accordance with the medical chain of command as outlined in the Bloomsburg University Emergency Action Plan will coordinate on-field emergency care for student-athletes suspected of sustaining a concussion. Recognition and management will occur as follows:



(Adapted from) *Scorza et.al. Current Concepts in Concussion Evaluation and Management American Family Physician, 2012 Jan 15; 85(2): 123-132.*

Bloomsburg University Concussion Management program is in accordance with the NCAA/DOD CARE Consortium research

Serial Evaluation and Monitoring:

1. Begin with 6 hour protocol on c3 Logix and paper packet (labeled Immediate protocol), when athlete first comes in with diagnosed or possible concussion. (No matter what).

2. The following day, begin 24-48 hour concussion protocol on C3Logix and in the paper packet (labeled 24-48 hour protocol).
    a. Keep on this protocol, in C3Logix, until athlete is either asymptomatic or back to baseline symptoms.
        i. The papers that need to be followed daily are SCAT and VOMs.
            1. Fill out these two papers during this protocol (DAILY).

3. Once athlete is either back to baseline or asymptomatic, begin Asymptomatic protocol. Both in C3Logix and in the paper packet (labeled Asymptomatic).
    a. Athlete must be cleared by team doctor, or doctor that diagnosed concussion, in order to start physical exertion. If concussed athlete is deemed ready, physician encounter for clearance to physical exertion may be done through electronic media, such as text message and/or phone call Concussion test results can also be transmitted electronically to physicians for review.
        i. Physical exertion, during asymptomatic protocol, will be progressive biking, through dictation of ATC. With HR and Blood Pressure being tracked before, during, and after activity.
            1. Symptoms and VOMs should still be tracked on paper during this protocol.
                a. Symptoms should be taken before and after activity.

4. After consent from ATC, athlete may advance to the return to play protocol.
    a. This protocol must be done on C3Logix and in the paper packet labeled (Return to Play).
        i. Activity on this protocol is solely up to the ATC.
            1. Make sure that symptoms are still being recorded through this protocol, both on C3Logix and paper.
    b. This protocol will end when ATC sees the athlete as fit to return to their respected sport.

*All steps of protocols will be documented and dated by ATC

Injury will be documented. Student-athlete will receive written and/or oral instructions for care and further procedures to ensure understanding and compliance.
Home care program will be discussed with student-athlete and another responsible adult who will help monitor them, such as roommate, friend, and parent.

Prolonged issues/recovery will necessitate further evaluation by a physician to consider additional diagnosis and best management options.

- Additional diagnoses may include but are not limited to:
    - Post-concussion syndrome
    - Sleep dysfunction
    - Migraine or other headache disorders
    - Mood disorders such as anxiety and depression
    - Ocular or vestibular dysfunction

Re-evaluation by team physician and members of the multidisciplinary team may be warranted for a student-athlete with symptoms lasting longer than two weeks

Return to Learn: Concussions generally result in impairment of neurologic function. This potential impairment affects the brain both physically and cognitively. As with the return-to-play protocol, it is important for the return-to-learn protocol to follow a stepwise progression which is tailored to meet individual needs and functions in a gradual manner of introducing cognitive stress. In order to implement this individualized academic progression, it should be done within the context of a multi-disciplinary team approach. This may include Supervising team physician(s), Certified Athletic Trainer, Academic advisor, Faculty Athletic Representative, and University health services. Complicated recovery from concussion may also necessitate the inclusion of Psychologist/Counselor, Learning Specialist, Audiologists, Speech Pathologists, Neuropsychologist, and/or Neurologist.

Throughout recovery, student-athletes should be exposed to a sub-symptom threshold cognitive stimulus, so as not to exacerbate symptoms. The sports medicine team dictates when the student-athlete can initiate a stepwise 'Return to Learn' progression, as well as the progression. The table below represents a phased rehabilitation progression for returning to academics. This table is an example and may be adjusted for individual needs. Progression may be increased or decreased with cognitive exposure based on the presence or absence of symptoms.

Departmental point person who may assist with navigating the return-to-learn protocol
Will include

- Kathleen Heitzman – Associate Director of Athletics
- Dr. Molly Marnella – Faculty Athletic Representative

Point people may be needed for modification of schedule and to assist with academic accommodations
For up to two weeks.
In the event of more complex cases of prolonged return-to-learn, re-evaluation by the team physician and members of the multidisciplinary team may be appropriate when symptoms last longer than two weeks. The Multidisciplinary team approach may include:

- Team Physician
- Athletic Training staff
- Psychologist/counselor
- Neuropsychologist consultant
- FAR
- Academic Counselor
- Course instructor(s)
- University Administrators
- Office of disability services
- Coaches

Return-to-Learn Assessment:

Student-athletes are typically referred to the Institute for Concussion Research & Services for evaluation of post-concussive injury assessment. In cases where the student-athletes warrants assistance in the academic environment, assessment is performed utilizing the following neurologic and cognitive assessments to establish learning recovery.

- The Trail Making Test Parts A & B:
- Processing Speed:
- Visual Acuity:

The Trail Making Test is a neuropsychological test that measures visual attention and task switching. In post-concussion patients, it can assess visual search speed, scanning, speed of cognitive processing, mental flexibility, as well as executive function (Trails Form B). These are important considerations in the assessment of the student-athlete's ability to perform and integrate themselves in academic work.
Processing speed is assessed using the Trail Making Test (Form A) and a modified version of the Symbol Digit Test which indicates cognitive functioning over time and recovery from concussive events. We maintain that these indices are relevant to return-to-learn environment where the student-athlete's cognitive recovery from concussion is paramount.

Following an injury or insult to the brain, there is often an interruption to the neurological system which innervate the extraocular muscles controlling eye movements as well as the system that regulates focusing (clear versus blurry vision). The common visual symptoms often associated with acquired brain injury are:

- diplopia (double vision)
- problems with ocular pursuits (eye movements, eye tracking ability)
- saccades (difficulties with shifting gaze quickly from one point to the other)
- accommodative inability (focusing)
- binocular vision (eye alignment)
- glare or light sensitivity
- Inability to maintain visual contact (or eye contact)

These visual issues are sometimes common following sport-related concussion and are important to resolve before the student-athlete re-enters the learning environment. Globally, it is the goal of Bloomsburg University to assess with scientific information whether the student-athlete is recovered to the point of rehabilitation and integration to the return-to-learn protocol. Student-athletes who recover to baseline or normative values in assessment will be integrated into the second rehabilitation stage (listed below) to allow for gradual reintroduction of cognitive activity.

Bloomsburg University offers a Speech & Hearing Clinic and an Audiology Balance Vestibular Clinic on campus. In cases of prolonged recovery or complex recovery associated with delayed return-to-learn student-athletes can be referred to these clinics for specialized assessment and care. These clinics are specifically designed to handle issues of cognitive and vestibular nature and can supplement clinical treatment of post-concussive recovery.

Immediately post-injury: No classroom activity on the same day as concussion, and individualized plans tailored to specific symptoms, i.e.:

- Remaining at home/in dorm if student-athlete cannot tolerate light cognitive activity

Rehabilitation Stage	Cognitive Exposure at Each Stage of Recovery
1. Daily Activities at home that do not give symptoms	Gradual return to typical daily activities - e.g. Reading, texting, screen time Start with 5-15 min at a time and gradually build up
2. School Activities	Homework, reading, or other cognitive activities outside of the classroom
3. Return to School part-time	Gradual introduction of schoolwork. May need to start with a partial school day or with increased breaks during the day
4. Return to School full-time	Gradually progress school activities until a full day can be tolerated

** (Adapted from) McCrory et al. 2016 Consensus statement on concussion in sport – 5th international conference on concussion in sport held in Berlin, October 2016, *British Journal of Sports Medicine:* published online April 26, 2017.**
Increase in symptoms and/or poor scores on clinical/cognitive measures will require immediate reassessment.

Supervising team physicians and the team's Certified Athletic Trainer will give the student-athlete an 'Return To Academics Form' (See Appendix K). This form will be used to inform the student health center, the student-athlete's professor, the associate director of athletics, and the Dean of Students, of their recent head injury as they recover from concussion. All academic considerations are consistent with provisions provided to students with documented brain injury under the Americans with Disabilities Act Amendments Act (ADAAA) of 2008. Communication between the team physician, athletic trainer, student-athlete, and professors is an essential component to the safe return of a student-athlete to academic demands.

RETURN-TO-PLAY (RTP)

FUNCTIONAL PROGRESSION

This protocol should not be initiated until the student-athlete is deemed to be back to baseline symptoms and all scores are WNL on all measures unless compelling evidence suggests otherwise. If signs or symptoms appear during a functional test, the test should be stopped immediately and the student-athlete monitored until all signs or symptoms resolve. No further functional testing should be performed that day. If symptoms do not resolve, the physician should be consulted and appropriate medical attention should be provided. When the student-athlete is again symptom free, he/she will need to move back at least one phase in the progression and begin again from there.

After each phase of functional testing, the presence of post-concussive symptoms should be assessed using the symptom evaluation scale. Progression to the next phase will require the student-athlete to remain symptom-free.

GRADUATED RETURN TO PLAY PROTOCOL

1: Symptom Limited Activity – Daily activities that do not provoke symptoms
2: Light, aerobic exercise, no resistance training
   Walking, stationary bike at slow to medium pace
3: Sport specific exercise
   Skating drills in hockey, running drills in soccer. No head-impact activities
4: Noncontact training drills
   Progression to more complex training drills (e.g. passing drills in football and ice hockey). May start progressive resistance training
5: Full-contact practice
   After medical clearance, participation in normal training activities
6: Return to play
   Normal game play

**(Adapted from) McCrory et al. 2016 Consensus statement on concussion in sport – 5th international conference on concussion in sport held in Berlin, October 2016, *British Journal of Sports Medicine:* published online April 26, 2017.

Student-athletes will not return to full participation until they have been cleared by a physician recommended by the athletic training staff or his/her designee. The student-athlete can only be cleared to return to play by an athletic trainer in accordance with a team physician of Bloomsburg University.

STUDENT-ATHLETES WITH MULTIPLE CONCUSSIONS WITHIN 365 DAYS

Student-athletes who sustain a second concussion within the same competitive season or an adjacent season should not begin the Functional Progression until he/she has been asymptomatic for 24 hours and all testing scores have returned to WNL. This student-athlete will not be allowed to return to full-contact participation until they have passed all testing scores returned to WNL.

Should a student-athlete sustain a third concussion within the same competitive season, or a subsequent season within that school year (or 365 days, whichever is greater), he/she may be excluded from competition for the remainder of those days. This type of situation will be evaluated by the team physician(s), and will be dealt with on a case by case basis.

McCory et. al. Consensus statement on concussion in sport – the 5th International Conference on Concussion in Sport held in Berlin, October 2016. British Journal of Sports Medicine: published online April 26, 2017.

Prolonged Recovery:

Some student-athletes that continue to have prolonged symptoms will be serially evaluated by their supervising team physician to measure/monitor the deterioration or improvement of their symptoms. The physician will then determine when referral is needed to diagnose the presence of additional pathology. Consultation may include but is not limited to neurologist(s), neurosurgeon(s), neuropsychologist(s), or therapist(s) trained in neural or vestibular rehabilitation. In addition, the physician and sports medicine staff will coordinate academic adjustments / considerations given the length of time the student-athlete may have been restricted from cognitive efforts. A multidisciplinary approach to the diagnosis and management of these complicated patients are consistent with international guidelines for mild traumatic brain injury management.

Reducing Exposure to Head Trauma:

Bloomsburg University is committed to student-athlete health and safety. To that end, Bloomsburg University will be proactive in efforts to minimize exposure to head trauma. The following procedures are in place:

- Concussion Fact Sheets, plus education regarding safe play and proper technique, are made available to student-athletes at the time of the pre-season.
- Concussion Fact Sheets, plus education regarding safe play and proper technique, are made available to coaches, sport administrators, team physicians, athletic trainers and strength and conditioning coaches on an annual basis.
- Adherence to 'Interassociation Consensus: Year-Round Football Practice Contact Recommendations.'
- Adherence to 'Interassociation Consensus: Independent Medical Care for College Student-Athletes Best Practices'
- Reducing gratuitous contact during practice.
- Taking the head out of contact.
- Teams will take a "safety-first" approach to sport.
- Coaching and student-athlete education regarding safe play and proper technique

Concussion Policy Review Procedures

This Concussion Management Policy will be reviewed by members of the sports medicine team. This will include the team physicians and athletic trainers. Updated editions will be submitted and approved by the athletic training department, the team physicians, and the Director of Athletics of Bloomsburg University in accordance with all NCAA and Pennsylvania State Athletic Conference mandates and requirements. All procedures must be completed prior to submission to the NCAA Concussion Safety Protocol Committee by May 1st annually.

Appendix A: NCAA Constitution By-Law 3.2.4.17

By-Law 3.2.4.17 Concussion Management Plan – An active member institution shall have a concussion management plan for its student athletes. The plan shall include, but is not limited to, the following:

(a) An annual process that ensures student-athletes are educated about the signs and symptoms of concussions. Student-athletes must acknowledge that they have received information about the signs and symptoms of concussions and that they have a responsibility to report concussion-related injuries and illnesses to a medical staff member;

(b) A process that ensures a student-athlete who exhibits signs and symptoms or behaviors consistent with a concussion shall be removed from athletics activities (e.g., competition, practice, conditioning sessions) and evaluated by a medical staff member (e.g., sports medicine staff, team physician) with experience in the evaluation and management of concussions;

(c) A policy that precludes a student-athlete diagnosed with a concussion from returning to athletics activity (e.g., competition, practice, conditioning sessions) for at least the remainder of that calendar day; and

(d) A policy that requires medical clearance for a student-athlete diagnosed with a concussion to return to the athletics activity (e.g., competition, practice, conditioning sessions) as determined by a physician (e.g., team physician) or the physician's designee.

Appendix B: USA Football: Heads Up Tackling™ technique

Appendix C: CDC & NCAA Educational Handout

CONCUSSION

A FACT SHEET FOR STUDENT-ATHLETES

WHAT IS A CONCUSSION?

A concussion is a brain injury that:

- Is caused by a blow to the head or body.
  - From contact with another player, hitting a hard surface such as the ground, ice or floor, or being hit by a piece of equipment such as a bat, lacrosse stick or field hockey ball.
- Can change the way your brain normally works.
- Can range from mild to severe.
- Presents itself differently for each athlete.
- Can occur during practice or competition in ANY sport.
- **Can happen even if you do not lose consciousness.**

HOW CAN I PREVENT A CONCUSSION?

Basic steps you can take to protect yourself from concussion:

- Do not initiate contact with your head or helmet. You can still get a concussion if you are wearing a helmet.
- Avoid striking an opponent in the head. Undercutting, flying elbows, stepping on a head, checking an unprotected opponent, and sticks to the head all cause concussions.
- Follow your athletics department's rules for safety and the rules of the sport.
- Practice good sportsmanship at all times.
- Practice and perfect the skills of the sport.

WHAT ARE THE SYMPTOMS OF A CONCUSSION?

You can't see a concussion, but you might notice some of the symptoms right away. Other symptoms can show up hours or days after the injury. Concussion symptoms include:

- Amnesia.
- Confusion.
- Headache.
- Loss of consciousness.
- Balance problems or dizziness.
- Double or fuzzy vision.
- Sensitivity to light or noise.
- Nausea (feeling that you might vomit).
- Feeling sluggish, foggy or groggy.
- Feeling unusually irritable.
- Concentration or memory problems (forgetting game plays, facts, meeting times).
- Slowed reaction time.

Exercise or activities that involve a lot of concentration, such as studying, working on the computer, or playing video games may cause concussion symptoms (such as headache or tiredness) to reappear or get worse.

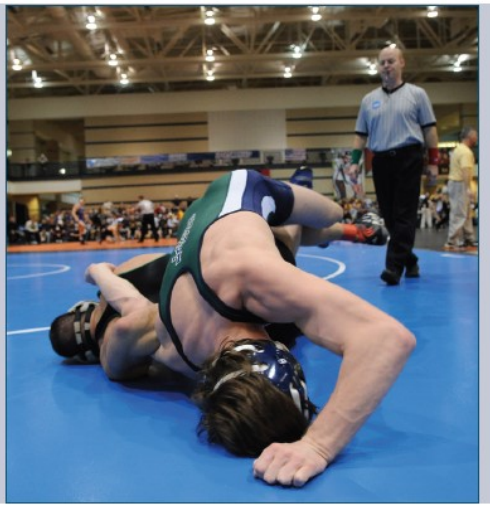
WHAT SHOULD I DO IF I THINK I HAVE A CONCUSSION?

Don't hide it. Tell your athletic trainer and coach. Never ignore a blow to the head. Also, tell your athletic trainer and coach if one of your teammates might have a concussion. Sports have injury timeouts and player substitutions so that you can get checked out.

Report it. Do not return to participation in a game, practice or other activity with symptoms. The sooner you get checked out, the sooner you may be able to return to play.

Get checked out. Your team physician, athletic trainer, or health care professional can tell you if you have had a concussion and when you are cleared to return to play. A concussion can affect your ability to perform everyday activities, your reaction time, balance, sleep and classroom performance.

Take time to recover. If you have had a concussion, your brain needs time to heal. While your brain is still healing, you are much more likely to have a repeat concussion. In rare cases, repeat concussions can cause permanent brain damage, and even death. Severe brain injury can change your whole life.



IT'S BETTER TO MISS ONE GAME THAN THE WHOLE SEASON. WHEN IN DOUBT, GET CHECKED OUT.

For more information and resources, visit www.NCAA.org/health-safety and www.CDC.gov/Concussion.

Reference to any commercial entity or product or service on this page should not be construed as an endorsement by the Government of the company or its products or services.

Appendix D: Bloomsburg University
Injury and Illness Reporting Form

I, _____, acknowledge that I have to be an active participant in my own healthcare. As such, I have the direct responsibility for reporting all of my injuries and illnesses to the sports medicine staff of my institution (e.g., team physician, athletic training staff). I recognize that my true physical condition is dependent upon my accurate medical history and a full disclosure of any symptoms, complaints, prior injuries and/or disabilities experienced. I hereby affirm that I have fully disclosed in writing any prior medical conditions and will also disclose any future conditions to the sports medicine staff at my institution.

I further understand that there is a possibility that participation in my sport may result in a head injury and/or concussion.

About Concussions:

A concussion is a traumatic brain injury that is caused by a blow to the head or body, and results in an alteration in mental status, with or without loss of consciousness.
Concussions can range from mild to severe, and may present differently in each student-athlete.
Symptoms of concussion include: amnesia / loss of memory, confusion, headache, loss of consciousness, groggy, feeling irritable, concentration or memory problems, and slowed reaction time.
A student-athlete who has suffered a concussion may not return to practice or competition until symptoms have resolved and he or she has received medical clearance.
Failure of a student-athlete to advise the sports medicine staff about symptoms of a head injury, concussion, or other injury or significant illness could result in serious and permanent harm.
I have been provided with education on head injuries and understand the importance of immediately reporting symptoms of a head injury/concussion to my sports medicine staff.

I hereby acknowledge: (1) that I have read and understand the above information; (2) that I have received educational materials about concussions and the opportunity to ask questions on the subject; and (3) that my participation in my sport may result in a head injury, concussion, or other injury or illness.

I accept responsibility for reporting all head injuries, symptoms of concussion, injuries of any kind, and significant illness to the sports medicine staff.

_____ _____
Printed Name of Student-Athlete Sport

_____ Date: _____
Signature of Student-Athlete

If Student-Athlete is under the age of 18, the signature of a parent or guardian is also required.
I certify that I am the Student-Athlete's parent or legal guardian, and that I have read this form, Understand the provisions hereof, and agree to be bound by the terms set forth herein, on behalf of the Student-Athlete and on my own behalf.

_____ _____
Printed Name of Parent or Guardian Signature of Parent or Guardian

Date: _____

Appendix E: Concussion Post-Injury Instruction Form

CONCUSSION POST-INJURY INSTRUCTION FORM

Name: _____ Date: _____

You have sustained a mild traumatic brain injury (concussion), which is a very serious injury and needs to be monitored. There are various signs and symptoms of a mild head injury that may show up immediately or several hours since initial injury. The following are signs and symptoms that you had during the initial evaluation:

HEADACHE OR PRESSURE	UNCONTROLLABLE EYE MOVEMENTS
NAUSEA AND/OR VOMITING	BALANCE PROBLEMS / DIZZINESS
FATIGUE	SENSITIVITY TO LIGHT / NOISE
ALTERED EMOTION/BEHAVIOR	RINGING IN THE EARS
NUMBNESS/TINGLING	FEELING SLOWED DOWN
FEELING IN A "FOG"	DIFFICULTY CONCENTRATING
DIFFICULTY REMEMBERING	CONFUSION / DISORIENTATION
DELAYED VERBAL / MOTOR SKILLS	SLURRED / INCOHERENT SPEECH
SLOWING OF PULSE	CONVULSIONS / TREMORS
BLURRED/DOUBLE VISION	SADNESS
CLEAR FLUID DRAINAGE FROM EAR/NOSE	BREATHING DIFFICULTY
AMNESIA (ANTEGRADE/RETROGRADE)	DROWSINESS
BLOOD/FLUID FROM THE EARS OR NOSE	WEAKNESS IN EITHER ARM OR LEG

You must report back to the Athletic Training Room tomorrow for a follow up evaluation. Please review the marked symptoms above.

If symptoms worsen, or if any of the additional symptoms appear, report them to the Athletic Trainer/Team Physician or the Emergency Department at the local hospital immediately. *

Otherwise, follow the instructions below:

It is OK to:

-Use Acetaminophen for headaches ***with approval*** from Team Physician. **(No medications before your appointment)** -Use ice pack on neck and/or head for comfort.

- Go to sleep at a decent hour (8hrs sleep)
- Cognitive and Physical Rest for the first 24 hours after injury.
- ***After 24 hours:*** You can walk to and attend class, and do homework as permitted by the health care provider.

DO NOT:

-Take aspirin/Ibuprofen (Advil/Motrin) for headaches
-Do any physical or cognitively strenuous activity
-Drink alcohol
-Drink more caffeinated beverages than normal
-Stay up late
-Engage in screen time: TV, video games, computer, cell phone, or loud music for long periods of time
-Drive vehicle when impaired
-Attend large group functions or parties

Appendix F: Coaches Concussion Education Acknowledgement Form

I, _____, acknowledge that as a member of the athletic department at, Bloomsburg University, I accept responsibility for supporting our athletic training department's policy on concussion management.

I understand that my student-athletes may have a risk of head injury and/or concussion. I also understand the importance of them reporting any such symptoms of a head injury/concussion to the sports medicine staff (e.g., team physician, head athletic trainer). I also accept responsibility for reporting to the sports medicine staff any signs or symptoms that I may witness.

By signing below, I acknowledge that the Bloomsburg University Athletic Training Department has provided me with educational materials and NCAA concussion fact Sheets and other applicable materials on what a concussion is and has given me an opportunity to ask questions about areas that are not clear to me on this issue.

I, _____have read the above and agree that the statements are accurate. I acknowledge having read and understand the concussion materials.

_____ _____

Signature of Coach Date

_____ _____

Name of person obtaining acknowledgement Signature of such person

Appendix G: Director of Athletics Concussion Education Acknowledgement Form

I, _____, acknowledge that as Director of Athletics
At Bloomsburg University, I accept responsibility for supporting our athletic training department's policy on concussion management.

I understand that my student-athletes may have a risk of head injury and/or concussion. I also understand the importance of them reporting any such symptoms of a head injury/concussion to the sports medicine staff (e.g., team physician, head athletic trainer).

By signing below, I acknowledge that the Bloomsburg University Athletic Training Department has provided me with educational materials and NCAA concussion fact Sheets and other applicable materials on what a concussion is and has given me an opportunity to ask questions about areas that are not clear to me on this issue.

I, _____have read the above and agree that the statements are accurate. I acknowledge having read and understand the concussion materials.

_____ _____

Signature of Director of Athletics Date

_____ _____

Name of person obtaining acknowledgement Signature of such person

Appendix H: Concussion Education Acknowledgement Form – Athletic Training

I, _____, acknowledge that as a member of the Athletic Training department at Bloomsburg University, I accept responsibility for supporting our athletic training department's policy on concussion management.

I understand that my student-athletes may have a risk of head injury and/or concussion. I also understand the importance of them reporting any such symptoms of a head injury/concussion to our sports medicine staff (e.g., team physician, head athletic trainer).

By signing below, I acknowledge that the Bloomsburg University Athletic Training Department has provided me with educational materials and NCAA concussion fact Sheets and other applicable materials on what a concussion is and has given me an opportunity to ask questions about areas that are not clear to me on this issue.

I, _____have read the above and agree that the statements are accurate. I acknowledge having read and understand the concussion materials.

_____ _____

Signature of Sports Medicine Personnel Date

_____ _____

Name of person obtaining acknowledgement Signature of such person

Appendix I: Concussion Education Acknowledgement Form – Team Physicians

I, _____, acknowledge that as the team physician at Bloomsburg University, I accept responsibility for supporting our athletic training department's policy on concussion management.

I understand that my student-athletes may have a risk of head injury and/or concussion. I also understand the importance of them reporting any such symptoms of a head injury/concussion to our sports medicine staff (e.g., team physician, head athletic trainer).

By signing below, I acknowledge that the Bloomsburg University Athletic Training Department has provided me with educational materials and NCAA concussion fact Sheets and other applicable materials on what a concussion is and has given me an opportunity to ask questions about areas that are not clear to me on this issue.

I, _____have read the above and agree that the statements are accurate. I acknowledge having read and understand the concussion materials.

_____ _____

Signature of Sports Medicine Personnel Date

_____ _____

Name of person obtaining acknowledgement Signature of such person

Appendix J: Concussion Education Acknowledgement Form – CARE Consortium

I, _____, acknowledge that as a member of the CARE Consortium at Bloomsburg University, I accept responsibility for supporting our athletic training department's policy on concussion management.

I understand that my student-athletes may have a risk of head injury and/or concussion. I also understand the importance of them reporting any such symptoms of a head injury/concussion to our sports medicine staff (e.g., team physician, head athletic trainer).

By signing below, I acknowledge that the Bloomsburg University Athletic Training Department has provided me with educational materials and NCAA concussion fact Sheets and other applicable materials on what a concussion is and has given me an opportunity to ask questions about areas that are not clear to me on this issue.

I, _____have read the above and agree that the statements are accurate. I acknowledge having read and understand the concussion materials.

_____ _____

Signature of Sports Medicine Personnel Date

_____ _____

Name of person obtaining acknowledgement Signature of such person

Appendix K: Return to Academics – Academic Restriction Form

Bloomsburg University Concussion Program

Patient Name: _____ Date Of Injury: ___/___/____ Date of Evaluation: ___/___/____

The student named above has suffered a concussion / mild traumatic brain injury and is currently under the care of The Bloomsburg University Athletic Training Staff, the Geisinger Orthopedic Physicians, and the Institute of Concussion Research and Services. Individuals with this type of injury may suffer from physical symptoms such as headaches, fatigue, dizziness and light sensitivity. They may also have difficulty with cognitive functioning such as concentration, short term memory, problem solving and multi-tasking. In addition, some will have difficulty with mood such as poor impulse control, anger and anxiety and depression. Each injury needs to be individualized and the below recommendations are based on our evaluation.

For Activities Classes

_____ No Physical Activity Class

_____ Restricted Physical Activity Class: Student should not participate in activities that would place the student at risk for a head injury. Should not participate in team sports such as basketball, soccer, dodge ball, softball, floor hockey, volleyball, etc. and all racquet sports. May participate in fitness such as running, riding a stationary bike, swimming, aerobics and weight training. The student should stop activity immediately with any return of symptoms.

_____ Consideration of the following academic adjustments to help mitigate symptoms:

__Extended time on exams/quizzes

__Exams/quizzes in quiet location

__Limit one exam per day

__Due dates/assignment extensions

__Use of a reader for exams/quizzes

__Permission to record lectures/note-taking assistance

__Absence from class due to scheduled rest periods

__Frequent breaks from class if symptomatic

__Late arrival or need to leave prior to the end of class

___Other: _____

___ No Activity: Complete Cognitive Rest - No school, no homework, no reading, no texting, no video games, no computer work.

___ Gradual Reintroduction of Cognitive Activity – Short periods school work at home

- ___ 5-15 minutes
- ___ 20-30 minutes

___ School Re-entry – Part day of school

- ___ Minutes per class

___ Resumption of full cognitive workload – Tests and catch up work

For additional information, please go to this link:
http://www.buhuskies.com/custompages/AthleticTraining/BU%20Concussion_POLICY_STATEMENT-2-3.pdf

Please feel free to contact me with any questions. Thank you for your attention and consideration.

_____ _____ _____ _____

Bloomsburg Univ Athletic Trainer | Office Phone | Email | Date

_____ _____ _____

Player name (Print) | Player Signature | Date

(Student signature gives consent to Bloomsburg University Athletic Training to communicate this condition with your Teachers)

_____ _____ _____

Team Physician (Print) | Team Physician Signature | Date

Appendix L

Certificate of Compliance

Bloomsburg University
Athletic Training

This certificate is to certify that the below mentioned groups associated with Bloomsburg University Intercollegiate Athletics, will be in compliance with the Bloomsburg University Concussion Management Protocol established on 8/1/2018.

- Bloomsburg University Faculty Athletic Training Staff
- Bloomsburg University Team Physicians – Geisinger Orthopedic Group
- Bloomsburg University Institute for Concussion Research and Services
- Bloomsburg University Director of Athletics
- Bloomsburg University Associate Director of Athletics
- Bloomsburg University Coaching staff
- Bloomsburg University Varsity Student-Athletes

_____	_____	_____
Name - Athletics Health Care Administrator	Signature – Athletics Health Care Administrator	Date

SCAT3™

Sport Concussion Assessment Tool – 3rd Edition

For use by medical professionals only

Name | Date/Time of Injury: Date of Assessment: | Examiner:

What is the SCAT3?[1]

The SCAT3 is a standardized tool for evaluating injured athletes for concussion and can be used in athletes aged from 13 years and older. It supersedes the original SCAT and the SCAT2 published in 2005 and 2009, respectively[2]. For younger persons, ages 12 and under, please use the Child SCAT3. The SCAT3 is designed for use by medical professionals. If you are not qualified, please use the Sport Concussion Recognition Tool[1]. Preseason baseline testing with the SCAT3 can be helpful for interpreting post-injury test scores.

Specific instructions for use of the SCAT3 are provided on page 3. If you are not familiar with the SCAT3, please read through these instructions carefully. This tool may be freely copied in its current form for distribution to individuals, teams, groups and organizations. Any revision or any reproduction in a digital form requires approval by the Concussion in Sport Group.

NOTE: The diagnosis of a concussion is a clinical judgment, ideally made by a medical professional. The SCAT3 should not be used solely to make, or exclude, the diagnosis of concussion in the absence of clinical judgement. An athlete may have a concussion even if their SCAT3 is "normal".

What is a concussion?

A concussion is a disturbance in brain function caused by a direct or indirect force to the head. It results in a variety of non-specific signs and/or symptoms (some examples listed below) and most often does not involve loss of consciousness. Concussion should be suspected in the presence of **any one or more** of the following:

- Symptoms (e.g., headache), or
- Physical signs (e.g., unsteadiness), or
- Impaired brain function (e.g. confusion) or
- Abnormal behaviour (e.g., change in personality).

SIDELINE ASSESSMENT

Indications for Emergency Management

NOTE: A hit to the head can sometimes be associated with a more serious brain injury. Any of the following warrants consideration of activating emergency procedures and urgent transportation to the nearest hospital:

- Glasgow Coma score less than 15
- Deteriorating mental status
- Potential spinal injury
- Progressive, worsening symptoms or new neurologic signs

Potential signs of concussion?

If any of the following signs are observed after a direct or indirect blow to the head, the athlete should stop participation, be evaluated by a medical professional and **should not be permitted to return to sport the same day** if a concussion is suspected.

Any loss of consciousness?	Y	N
"If so, how long?"		
Balance or motor incoordination (stumbles, slow/laboured movements, etc.)?	Y	N
Disorientation or confusion (inability to respond appropriately to questions)?	Y	N
Loss of memory:	Y	N
"If so, how long?"		
"Before or after the injury?"		
Blank or vacant look:	Y	N
Visible facial injury in combination with any of the above:	Y	N

1 Glasgow coma scale (GCS)

Best eye response (E)	
No eye opening	1
Eye opening in response to pain	2
Eye opening to speech	3
Eyes opening spontaneously	4
Best verbal response (V)	
No verbal response	1
Incomprehensible sounds	2
Inappropriate words	3
Confused	4
Oriented	5
Best motor response (M)	
No motor response	1
Extension to pain	2
Abnormal flexion to pain	3
Flexion/Withdrawal to pain	4
Localizes to pain	5
Obeys commands	6
Glasgow Coma score (E + V + M)	of 15

GCS should be recorded for all athletes in case of subsequent deterioration.

2 Maddocks Score[3]

"I am going to ask you a few questions, please listen carefully and give your best effort."

Modified Maddocks questions (1 point for each correct answer)

What venue are we at today?	0	1
Which half is it now?	0	1
Who scored last in this match?	0	1
What team did you play last week/game?	0	1
Did your team win the last game?	0	1
Maddocks score		of 5

Maddocks score is validated for sideline diagnosis of concussion only and is not used for serial testing.

Notes: Mechanism of Injury ("tell me what happened"?):

Any athlete with a suspected concussion should be REMOVED FROM PLAY, medically assessed, monitored for deterioration (i.e., should not be left alone) and should not drive a motor vehicle until cleared to do so by a medical professional. No athlete diagnosed with concussion should be returned to sports participation on the day of Injury.

BACKGROUND

Name: _____ Date: _____

Examiner: _____

Sport/team/school: _____ Date/time of injury: _____

Age: _____ Gender: ☐ M ☐ F

Years of education completed: _____

Dominant hand: ☐ right ☐ left ☐ neither

How many concussions do you think you have had in the past? _____

When was the most recent concussion? _____

How long was your recovery from the most recent concussion? _____

Have you ever been hospitalized or had medical imaging done for a head injury? ☐ Y ☐ N

Have you ever been diagnosed with headaches or migraines? ☐ Y ☐ N

Do you have a learning disability, dyslexia, ADD/ADHD? ☐ Y ☐ N

Have you ever been diagnosed with depression, anxiety or other psychiatric disorder? ☐ Y ☐ N

Has anyone in your family ever been diagnosed with any of these problems? ☐ Y ☐ N

Are you on any medications? If yes, please list: ☐ Y ☐ N

_____

SCAT3 to be done in resting state. Best done 10 or more minutes post excercise.

SYMPTOM EVALUATION

3 How do you feel?

"You should score yourself on the following symptoms, based on how you feel now".

	none	mild		moderate		severe	
Headache	0	1	2	3	4	5	6
"Pressure in head"	0	1	2	3	4	5	6
Neck Pain	0	1	2	3	4	5	6
Nausea or vomiting	0	1	2	3	4	5	6
Dizziness	0	1	2	3	4	5	6
Blurred vision	0	1	2	3	4	5	6
Balance problems	0	1	2	3	4	5	6
Sensitivity to light	0	1	2	3	4	5	6
Sensitivity to noise	0	1	2	3	4	5	6
Feeling slowed down	0	1	2	3	4	5	6
Feeling like "in a fog"	0	1	2	3	4	5	6
"Don't feel right"	0	1	2	3	4	5	6
Difficulty concentrating	0	1	2	3	4	5	6
Difficulty remembering	0	1	2	3	4	5	6
Fatigue or low energy	0	1	2	3	4	5	6
Confusion	0	1	2	3	4	5	6
Drowsiness	0	1	2	3	4	5	6
Trouble falling asleep	0	1	2	3	4	5	6
More emotional	0	1	2	3	4	5	6
Irritability	0	1	2	3	4	5	6
Sadness	0	1	2	3	4	5	6
Nervous or Anxious	0	1	2	3	4	5	6

Total number of symptoms (Maximum possible 22) _____

Symptom severity score (Maximum possible 132) _____

Do the symptoms get worse with physical activity? ☐ Y ☐ N

Do the symptoms get worse with mental activity? ☐ Y ☐ N

☐ self rated ☐ self rated and clinician monitored

☐ clinician interview ☐ self rated with parent input

Overall rating: If you know the athlete well prior to the injury, how different is the athlete acting compared to his/her usual self?

Please circle one response:

no different	very different	unsure	N/A

Scoring on the SCAT3 should not be used as a stand-alone method to diagnose concussion, measure recovery or make decisions about an athlete's readiness to return to competition after concussion. Since signs and symptoms may evolve over time, it is important to consider repeat evaluation in the acute assessment of concussion.

COGNITIVE & PHYSICAL EVALUATION

4 Cognitive assessment

Standardized Assessment of Concussion (SAC)[4]

Orientation (1 point for each correct answer)

What month is it?	0	1
What is the date today?	0	1
What is the day of the week?	0	1
What year is it?	0	1
What time is it right now? (within 1 hour)	0	1

Orientation score _____ of 5

Immediate memory

List	Trial 1	Trial 2	Trial 3	Alternative word list		
elbow	0 1	0 1	0 1	candle	baby	finger
apple	0 1	0 1	0 1	paper	monkey	penny
carpet	0 1	0 1	0 1	sugar	perfume	blanket
saddle	0 1	0 1	0 1	sandwich	sunset	lemon
bubble	0 1	0 1	0 1	wagon	iron	insect
Total						

Immediate memory score total _____ of 15

Concentration: Digits Backward

List	Trial 1	Alternative digit list		
4-9-3	0 1	6-2-9	5-2-6	4-1-5
3-8-1-4	0 1	3-2-7-9	1-7-9-5	4-9-6-8
6-2-9-7-1	0 1	1-5-2-8-6	3-8-5-2-7	6-1-8-4-3
7-1-8-4-6-2	0 1	5-3-9-1-4-8	8-3-1-9-6-4	7-2-4-8-5-6
Total of 4				

Concentration: Month in Reverse Order (1 pt. for entire sequence correct)

Dec-Nov-Oct-Sept-Aug-Jul-Jun-May-Apr-Mar-Feb-Jan	0	1

Concentration score _____ of 5

5 Neck Examination:

Range of motion Tenderness Upper and lower limb sensation & strength

Findings: _____

6 Balance examination

Do one or both of the following tests.

Footwear (shoes, barefoot, braces, tape, etc.) _____

Modified Balance Error Scoring System (BESS) testing[5]

Which foot was tested (i.e. which is the **non-dominant** foot) ☐ Left ☐ Right

Testing surface (hard floor, field, etc.) _____

Condition

Double leg stance:	Errors
Single leg stance (non-dominant foot):	Errors
Tandem stance (non-dominant foot at back):	Errors

And / Or

Tandem gait[6,7]

Time (best of 4 trials): _____ seconds

7 Coordination examination

Upper limb coordination

Which arm was tested: ☐ Left ☐ Right

Coordination score _____ of 1

8 SAC Delayed Recall[4]

Delayed recall score _____ of 5

INSTRUCTIONS

Words in *Italics* throughout the SCAT3 are the instructions given to the athlete by the tester.

Symptom Scale

"You should score yourself on the following symptoms, based on how you feel now".

To be completed by the athlete. In situations where the symptom scale is being completed after exercise, it should still be done in a resting state, at least 10 minutes post exercise.

For total number of symptoms, maximum possible is 22.

For Symptom severity score, add all scores in table, maximum possible is 22 x 6 = 132.

SAC[4]

Immediate Memory

"I am going to test your memory. I will read you a list of words and when I am done, repeat back as many words as you can remember, in any order."

Trials 2 & 3:

"I am going to repeat the same list again. Repeat back as many words as you can remember in any order, even if you said the word before."

Complete all 3 trials regardless of score on trial 1 & 2. Read the words at a rate of one per second. **Score 1 pt. for each correct response.** Total score equals sum across all 3 trials. Do not inform the athlete that delayed recall will be tested.

Concentration

Digits backward

"I am going to read you a string of numbers and when I am done, you repeat them back to me backwards, in reverse order of how I read them to you. For example, if I say 7-1-9, you would say 9-1-7."

If correct, go to next string length. If incorrect, read trial 2. **One point possible for each string length**. Stop after incorrect on both trials. The digits should be read at the rate of one per second.

Months in reverse order

"Now tell me the months of the year in reverse order. Start with the last month and go backward. So you'll say December, November … Go ahead"

1 pt. for entire sequence correct

Delayed Recall

The delayed recall should be performed after completion of the Balance and Coordination Examination.

"Do you remember that list of words I read a few times earlier? Tell me as many words from the list as you can remember in any order."

Score 1 pt. for each correct response

Balance Examination

Modified Balance Error Scoring System (BESS) testing[5]

This balance testing is based on a modified version of the Balance Error Scoring System (BESS)[5]. A stopwatch or watch with a second hand is required for this testing.

"I am now going to test your balance. Please take your shoes off, roll up your pant legs above ankle (if applicable), and remove any ankle taping (if applicable). This test will consist of three twenty second tests with different stances."

(a) Double leg stance:

"The first stance is standing with your feet together with your hands on your hips and with your eyes closed. You should try to maintain stability in that position for 20 seconds. I will be counting the number of times you move out of this position. I will start timing when you are set and have closed your eyes."

(b) Single leg stance:

"If you were to kick a ball, which foot would you use? [This will be the dominant foot] Now stand on your non-dominant foot. The dominant leg should be held in approximately 30 degrees of hip flexion and 45 degrees of knee flexion. Again, you should try to maintain stability for 20 seconds with your hands on your hips and your eyes closed. I will be counting the number of times you move out of this position. If you stumble out of this position, open your eyes and return to the start position and continue balancing. I will start timing when you are set and have closed your eyes."

(c) Tandem stance:

"Now stand heel-to-toe with your non-dominant foot in back. Your weight should be evenly distributed across both feet. Again, you should try to maintain stability for 20 seconds with your hands on your hips and your eyes closed. I will be counting the number of times you move out of this position. If you stumble out of this position, open your eyes and return to the start position and continue balancing. I will start timing when you are set and have closed your eyes."

Balance testing – types of errors

1. Hands lifted off iliac crest
2. Opening eyes
3. Step, stumble, or fall
4. Moving hip into > 30 degrees abduction
5. Lifting forefoot or heel
6. Remaining out of test position > 5 sec

Each of the 20-second trials is scored by counting the errors, or deviations from the proper stance, accumulated by the athlete. The examiner will begin counting errors only after the individual has assumed the proper start position. **The modified BESS is calculated by adding one error point for each error during the three 20-second tests. The maximum total number of errors for any single condition is 10.** If a athlete commits multiple errors simultaneously, only one error is recorded but the athlete should quickly return to the testing position, and counting should resume once subject is set. Subjects that are unable to maintain the testing procedure for a minimum of **five seconds** at the start are assigned the highest possible score, ten, for that testing condition.

OPTION: For further assessment, the same 3 stances can be performed on a surface of medium density foam (e.g., approximately 50 cm x 40 cm x 6 cm).

Tandem Gait[6,7]

Participants are instructed to stand with their feet together behind a starting line (the test is best done with footwear removed). Then, they walk in a forward direction as quickly and as accurately as possible along a 38mm wide (sports tape), 3 meter line with an alternate foot heel-to-toe gait ensuring that they approximate their heel and toe on each step. Once they cross the end of the 3m line, they turn 180 degrees and return to the starting point using the same gait. A total of 4 trials are done and the best time is retained. Athletes should complete the test in 14 seconds. Athletes fail the test if they step off the line, have a separation between their heel and toe, or if they touch or grab the examiner or an object. In this case, the time is not recorded and the trial repeated, if appropriate.

Coordination Examination

Upper limb coordination

Finger-to-nose (FTN) task:

"I am going to test your coordination now. Please sit comfortably on the chair with your eyes open and your arm (either right or left) outstretched (shoulder flexed to 90 degrees and elbow and fingers extended), pointing in front of you. When I give a start signal, I would like you to perform five successive finger to nose repetitions using your index finger to touch the tip of the nose, and then return to the starting position, as quickly and as accurately as possible."

Scoring: 5 correct repetitions in < 4 seconds = 1

Note for testers: Athletes fail the test if they do not touch their nose, do not fully extend their elbow or do not perform five repetitions. **Failure should be scored as 0.**

References & Footnotes

1. This tool has been developed by a group of international experts at the 4th International Consensus meeting on Concussion in Sport held in Zurich, Switzerland in November 2012. The full details of the conference outcomes and the authors of the tool are published in The BJSM Injury Prevention and Health Protection, 2013, Volume 47, Issue 5. The outcome paper will also be simultaneously co-published in other leading biomedical journals with the copyright held by the Concussion in Sport Group, to allow unrestricted distribution, providing no alterations are made.

2. McCrory P et al., Consensus Statement on Concussion in Sport – the 3rd International Conference on Concussion in Sport held in Zurich, November 2008. British Journal of Sports Medicine 2009; 43: i76-89.

3. Maddocks, DL; Dicker, GD; Saling, MM. The assessment of orientation following concussion in athletes. Clinical Journal of Sport Medicine. 1995; 5(1): 32–3.

4. McCrea M. Standardized mental status testing of acute concussion. Clinical Journal of Sport Medicine. 2001; 11: 176–181.

5. Guskiewicz KM. Assessment of postural stability following sport-related concussion. Current Sports Medicine Reports. 2003; 2: 24–30.

6. Schneiders, A.G., Sullivan, S.J., Gray, A., Hammond-Tooke, G. & McCrory, P. Normative values for 16-37 year old subjects for three clinical measures of motor performance used in the assessment of sports concussions. Journal of Science and Medicine in Sport. 2010; 13(2): 196–201.

7. Schneiders, A.G., Sullivan, S.J., Kvarnstrom. J.K., Olsson, M., Yden. T. & Marshall, S.W. The effect of footwear and sports-surface on dynamic neurological screening in sport-related concussion. Journal of Science and Medicine in Sport. 2010; 13(4): 382–386

ATHLETE INFORMATION

Any athlete suspected of having a concussion should be removed from play, and then seek medical evaluation.

Signs to watch for

Problems could arise over the first 24–48 hours. The athlete should not be left alone and must go to a hospital at once if they:

- Have a headache that gets worse
- Are very drowsy or can't be awakened
- Can't recognize people or places
- Have repeated vomiting
- Behave unusually or seem confused; are very irritable
- Have seizures (arms and legs jerk uncontrollably)
- Have weak or numb arms or legs
- Are unsteady on their feet; have slurred speech

Remember, it is better to be safe.
Consult your doctor after a suspected concussion.

Return to play

Athletes should not be returned to play the same day of injury.
When returning athletes to play, they should be **medically cleared and then follow a stepwise supervised program,** with stages of progression.

For example:

Rehabilitation stage	Functional exercise at each stage of rehabilitation	Objective of each stage
No activity	Physical and cognitive rest	Recovery
Light aerobic exercise	Walking, swimming or stationary cycling keeping intensity, 70 % maximum predicted heart rate. No resistance training	Increase heart rate
Sport-specific exercise	Skating drills in ice hockey, running drills in soccer. No head impact activities	Add movement
Non-contact training drills	Progression to more complex training drills, eg passing drills in football and ice hockey. May start progressive resistance training	Exercise, coordination, and cognitive load
Full contact practice	Following medical clearance participate in normal training activities	Restore confidence and assess functional skills by coaching staff
Return to play	Normal game play	

There should be at least 24 hours (or longer) for each stage and if symptoms recur the athlete should rest until they resolve once again and then resume the program at the previous asymptomatic stage. Resistance training should only be added in the later stages.

If the athlete is symptomatic for more than 10 days, then consultation by a medical practitioner who is expert in the management of concussion, is recommended.

Medical clearance should be given before return to play.

Scoring Summary:

Test Domain	Score		
	Date:	Date:	Date:
Number of Symptoms of 22			
Symptom Severity Score of 132			
Orientation of 5			
Immediate Memory of 15			
Concentration of 5			
Delayed Recall of 5			
SAC Total			
BESS (total errors)			
Tandem Gait (seconds)			
Coordination of 1			

Notes:

CONCUSSION INJURY ADVICE

(To be given to the **person monitoring** the concussed athlete)

This patient has received an injury to the head. A careful medical examination has been carried out and no sign of any serious complications has been found. Recovery time is variable across individuals and the patient will need monitoring for a further period by a responsible adult. Your treating physician will provide guidance as to this timeframe.

If you notice any change in behaviour, vomiting, dizziness, worsening headache, double vision or excessive drowsiness, please contact your doctor or the nearest hospital emergency department immediately.

Other important points:

- Rest (physically and mentally), including training or playing sports until symptoms resolve and you are medically cleared
- No alcohol
- No prescription or non-prescription drugs without medical supervision. Specifically:
  - No sleeping tablets
  - Do not use aspirin, anti-inflammatory medication or sedating pain killers
- Do not drive until medically cleared
- Do not train or play sport until medically cleared

Clinic phone number

Patient's name

Date/time of injury

Date/time of medical review

Treating physician

Contact details or stamp

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SCAT5©

SPORT CONCUSSION ASSESSMENT TOOL — 5TH EDITION

DEVELOPED BY THE CONCUSSION IN SPORT GROUP

FOR USE BY MEDICAL PROFESSIONALS ONLY

supported by

Patient details

Name: _____

DOB: _____

Address: _____

ID number: _____

Examiner: _____

Date of Injury: _____ Time: _____

WHAT IS THE SCAT5?

The SCAT5 is a standardized tool for evaluating concussions designed for use by physicians and licensed healthcare professionals[1]. The SCAT5 cannot be performed correctly in less than 10 minutes.

If you are not a physician or licensed healthcare professional, please use the Concussion Recognition Tool 5 (CRT5). The SCAT5 is to be used for evaluating athletes aged 13 years and older. For children aged 12 years or younger, please use the Child SCAT5.

Preseason SCAT5 baseline testing can be useful for interpreting post-injury test scores, but is not required for that purpose.Detailed instructions for use of the SCAT5 are provided on page 7. Please read through these instructions carefully before testing the athlete. Brief verbal instructions for each test are given in italics. The only equipment required for the tester is a watch or timer.

Recognise and Remove

A head impact by either a direct blow or indirect transmission of force can be associated with a serious and potentially fatal brain injury. If there are significant concerns, including any of the red flags listed in Box 1, then activation of emergency procedures and urgent transport to the nearest hospital should be arranged.

Key points

- Any athlete with suspected concussion should be REMOVED FROM PLAY, medically assessed and monitored for deterioration. No athlete diagnosed with concussion should be returned to play on the day of injury.
- If an athlete is suspected of having a concussion and medical personnel are not immediately available, the athlete should be referred to a medical facility for urgent assessment.
- Athletes with suspected concussion should not drink alcohol, use recreational drugs and should not drive a motor vehicle until cleared to do so by a medical professional.
- Concussion signs and symptoms evolve over time and it is important to consider repeat evaluation in the assessment of concussion.
- The diagnosis of a concussion is a clinical judgment, made by a medical professional. The SCAT5 should NOT be used by itself to make, or exclude, the diagnosis of concussion. An athlete may have a concussion even if their SCAT5 is "normal".

Remember:

- The basic principles of first aid (danger, response, airway, breathing, circulation) should be followed.
- Do not attempt to move the athlete (other than that required for airway management) unless trained to do so.
- Assessment for a spinal cord injury is a critical part of the initial on-field assessment.
- Do not remove a helmet or any other equipment unless trained to do so safely.

1

IMMEDIATE OR ON-FIELD ASSESSMENT

The following elements should be assessed for all athletes who are suspected of having a concussion prior to proceeding to the neurocognitive assessment and ideally should be done on-field after the first first aid / emergency care priorities are completed.

If any of the "Red Flags" or observable signs are noted after a direct or indirect blow to the head, the athlete should be immediately and safely removed from participation and evaluated by a physician or licensed healthcare professional.

Consideration of transportation to a medical facility should be at the discretion of the physician or licensed healthcare professional.

The GCS is important as a standard measure for all patients and can be done serially if necessary in the event of deterioration in conscious state. The Maddocks questions and cervical spine exam are critical steps of the immediate assessment; however, these do not need to be done serially.

STEP 1: RED FLAGS

RED FLAGS:

- **Neck pain or tenderness**
- **Double vision**
- **Weakness or tingling/ burning in arms or legs**
- **Severe or increasing headache**
- **Seizure or convulsion**
- **Loss of consciousness**
- **Deteriorating conscious state**
- **Vomiting**
- **Increasingly restless, agitated or combative**

STEP 2: OBSERVABLE SIGNS

Witnessed ☐ Observed on Video ☐

Lying motionless on the playing surface	Y	N
Balance / gait difficulties / motor incoordination: stumbling, slow / laboured movements	Y	N
Disorientation or confusion, or an inability to respond appropriately to questions	Y	N
Blank or vacant look	Y	N
Facial injury after head trauma	Y	N

STEP 3: MEMORY ASSESSMENT MADDOCKS QUESTIONS[2]

"I am going to ask you a few questions, please listen carefully and give your best effort. First, tell me what happened?"

Mark Y for correct answer / N for incorrect

What venue are we at today?	Y	N
Which half is it now?	Y	N
Who scored last in this match?	Y	N
What team did you play last week / game?	Y	N
Did your team win the last game?	Y	N

Note: Appropriate sport-specific questions may be substituted.

Name: _____

DOB: _____

Address: _____

ID number: _____

Examiner: _____

Date: _____

STEP 4: EXAMINATION GLASGOW COMA SCALE (GCS)[3]

Time of assessment			
Date of assessment			
Best eye response (E)			
No eye opening	1	1	1
Eye opening in response to pain	2	2	2
Eye opening to speech	3	3	3
Eyes opening spontaneously	4	4	4
Best verbal response (V)			
No verbal response	1	1	1
Incomprehensible sounds	2	2	2
Inappropriate words	3	3	3
Confused	4	4	4
Oriented	5	5	5
Best motor response (M)			
No motor response	1	1	1
Extension to pain	2	2	2
Abnormal flexion to pain	3	3	3
Flexion / Withdrawal to pain	4	4	4
Localizes to pain	5	5	5
Obeys commands	6	6	6
Glasgow Coma score (E + V + M)			

CERVICAL SPINE ASSESSMENT

Does the athlete report that their neck is pain free at rest?	Y	N
If there is NO neck pain at rest, does the athlete have a full range of ACTIVE pain free movement?	Y	N
Is the limb strength and sensation normal?	Y	N

In a patient who is not lucid or fully conscious, a cervical spine injury should be assumed until proven otherwise.

OFFICE OR OFF-FIELD ASSESSMENT

Please note that the neurocognitive assessment should be done in a distraction-free environment with the athlete in a resting state.

STEP 1: ATHLETE BACKGROUND

Sport / team / school: _____

Date / time of injury: _____

Years of education completed: _____

Age: _____

Gender: M / F / Other

Dominant hand: left / neither / right

How many diagnosed concussions has the athlete had in the past?: _____

When was the most recent concussion?: _____

How long was the recovery (time to being cleared to play) from the most recent concussion?: _____ (days)

Has the athlete ever been:

Hospitalized for a head injury?	Yes	No
Diagnosed / treated for headache disorder or migraines?	Yes	No
Diagnosed with a learning disability / dyslexia?	Yes	No
Diagnosed with ADD / ADHD?	Yes	No
Diagnosed with depression, anxiety or other psychiatric disorder?	Yes	No

Current medications? If yes, please list:

_____

_____

_____

_____

_____

_____

Name: _____

DOB: _____

Address: _____

ID number: _____

Examiner: _____

Date: _____

2

STEP 2: SYMPTOM EVALUATION

The athlete should be given the symptom form and asked to read this instruction paragraph out loud then complete the symptom scale. For the baseline assessment, the athlete should rate his/her symptoms based on how he/she typically feels and for the post injury assessment the athlete should rate their symptoms at this point in time.

Please Check: ☐ **Baseline** ☐ **Post-Injury**

Please hand the form to the athlete

	none	mild		moderate		severe	
Headache	0	1	2	3	4	5	6
"Pressure in head"	0	1	2	3	4	5	6
Neck Pain	0	1	2	3	4	5	6
Nausea or vomiting	0	1	2	3	4	5	6
Dizziness	0	1	2	3	4	5	6
Blurred vision	0	1	2	3	4	5	6
Balance problems	0	1	2	3	4	5	6
Sensitivity to light	0	1	2	3	4	5	6
Sensitivity to noise	0	1	2	3	4	5	6
Feeling slowed down	0	1	2	3	4	5	6
Feeling like "in a fog"	0	1	2	3	4	5	6
"Don't feel right"	0	1	2	3	4	5	6
Difficulty concentrating	0	1	2	3	4	5	6
Difficulty remembering	0	1	2	3	4	5	6
Fatigue or low energy	0	1	2	3	4	5	6
Confusion	0	1	2	3	4	5	6
Drowsiness	0	1	2	3	4	5	6
More emotional	0	1	2	3	4	5	6
Irritability	0	1	2	3	4	5	6
Sadness	0	1	2	3	4	5	6
Nervous or Anxious	0	1	2	3	4	5	6
Trouble falling asleep (if applicable)	0	1	2	3	4	5	6

Total number of symptoms:	of 22
Symptom severity score:	of 132
Do your symptoms get worse with physical activity?	Y N
Do your symptoms get worse with mental activity?	Y N
If 100% is feeling perfectly normal, what percent of normal do you feel?	

If not 100%, why?

_____

_____

_____

Please hand form back to examiner

3

STEP 3: COGNITIVE SCREENING

Standardised Assessment of Concussion (SAC)[4]

Name: _____

DOB: _____

Address: _____

ID number: _____

Examiner: _____

Date: _____

ORIENTATION

What month is it?	0	1
What is the date today?	0	1
What is the day of the week?	0	1
What year is it?	0	1
What time is it right now? (within 1 hour)	0	1
Orientation score		of 5

IMMEDIATE MEMORY

The Immediate Memory component can be completed using the traditional 5-word per trial list or optionally using 10-words per trial to minimise any ceiling effect. All 3 trials must be administered irrespective of the number correct on the first trial. Administer at the rate of one word per second.

Please choose EITHER the 5 or 10 word list groups and circle the specific word list chosen for this test.

I am going to test your memory. I will read you a list of words and when I am done, repeat back as many words as you can remember, in any order. For Trials 2 & 3: I am going to repeat the same list again. Repeat back as many words as you can remember in any order, even if you said the word before.

List	Alternate 5 word lists					Score (of 5) Trial 1	Trial 2	Trial 3
A	Finger	Penny	Blanket	Lemon	Insect			
B	Candle	Paper	Sugar	Sandwich	Wagon			
C	Baby	Monkey	Perfume	Sunset	Iron			
D	Elbow	Apple	Carpet	Saddle	Bubble			
E	Jacket	Arrow	Pepper	Cotton	Movie			
F	Dollar	Honey	Mirror	Saddle	Anchor			
					Immediate Memory Score			of 15
					Time that last trial was completed			

List	Alternate 10 word lists					Score (of 10) Trial 1	Trial 2	Trial 3
G	Finger Candle	Penny Paper	Blanket Sugar	Lemon Sandwich	Insect Wagon			
H	Baby Elbow	Monkey Apple	Perfume Carpet	Sunset Saddle	Iron Bubble			
I	Jacket Dollar	Arrow Honey	Pepper Mirror	Cotton Saddle	Movie Anchor			
					Immediate Memory Score			of 30
					Time that last trial was completed			

CONCENTRATION

DIGITS BACKWARDS

Please circle the Digit list chosen (A, B, C, D, E, F). Administer at the rate of one digit per second reading DOWN the selected column.

I am going to read a string of numbers and when I am done, you repeat them back to me in reverse order of how I read them to you. For example, if I say 7-1-9, you would say 9-1-7.

Concentration Number Lists (circle one)					
List A	List B	List C			
4-9-3	5-2-6	1-4-2	Y	N	0
6-2-9	4-1-5	6-5-8	Y	N	1
3-8-1-4	1-7-9-5	6-8-3-1	Y	N	0
3-2-7-9	4-9-6-8	3-4-8-1	Y	N	1
6-2-9-7-1	4-8-5-2-7	4-9-1-5-3	Y	N	0
1-5-2-8-6	6-1-8-4-3	6-8-2-5-1	Y	N	1
7-1-8-4-6-2	8-3-1-9-6-4	3-7-6-5-1-9	Y	N	0
5-3-9-1-4-8	7-2-4-8-5-6	9-2-6-5-1-4	Y	N	1
List D	List E	List F			
7-8-2	3-8-2	2-7-1	Y	N	0
9-2-6	5-1-8	4-7-9	Y	N	1
4-1-8-3	2-7-9-3	1-6-8-3	Y	N	0
9-7-2-3	2-1-6-9	3-9-2-4	Y	N	1
1-7-9-2-6	4-1-8-6-9	2-4-7-5-8	Y	N	0
4-1-7-5-2	9-4-1-7-5	8-3-9-6-4	Y	N	1
2-6-4-8-1-7	6-9-7-3-8-2	5-8-6-2-4-9	Y	N	0
8-4-1-9-3-5	4-2-7-9-3-8	3-1-7-8-2-6	Y	N	1
		Digits Score:			of 4

MONTHS IN REVERSE ORDER

Now tell me the months of the year in reverse order. Start with the last month and go backward. So you'll say December, November. Go ahead.

Dec - Nov - Oct - Sept - Aug - Jul - Jun - May - Apr - Mar - Feb - Jan	0 1
Months Score	of 1
Concentration Total Score (Digits + Months)	of 5

4

STEP 4: NEUROLOGICAL SCREEN

See the instruction sheet (page 7) for details of test administration and scoring of the tests.

Can the patient read aloud (e.g. symptom check-list) and follow instructions without difficulty?	Y	N
Does the patient have a full range of pain-free PASSIVE cervical spine movement?	Y	N
Without moving their head or neck, can the patient look side-to-side and up-and-down without double vision?	Y	N
Can the patient perform the finger nose coordination test normally?	Y	N
Can the patient perform tandem gait normally?	Y	N

BALANCE EXAMINATION

Modified Balance Error Scoring System (mBESS) testing[5]

Which foot was tested (i.e. which is the non-dominant foot) ☐ Left ☐ Right

Testing surface (hard floor, field, etc.) _____

Footwear (shoes, barefoot, braces, tape, etc.) _____

Condition	Errors
Double leg stance	of 10
Single leg stance (non-dominant foot)	of 10
Tandem stance (non-dominant foot at the back)	of 10
Total Errors	of 30

Name: _____

DOB: _____

Address: _____

ID number: _____

Examiner: _____

Date: _____

5

STEP 5: DELAYED RECALL:

The delayed recall should be performed after 5 minutes have elapsed since the end of the Immediate Recall section. Score 1 pt. for each correct response.

Do you remember that list of words I read a few times earlier? Tell me as many words from the list as you can remember in any order.

Time Started

Please record each word correctly recalled. Total score equals number of words recalled.

_____

_____

_____

Total number of words recalled accurately: of 5 or of 10

6

STEP 6: DECISION

Domain	Date & time of assessment:		
Symptom number (of 22)			
Symptom severity score (of 132)			
Orientation (of 5)			
Immediate memory	of 15 of 30	of 15 of 30	of 15 of 30
Concentration (of 5)			
Neuro exam	Normal Abnormal	Normal Abnormal	Normal Abnormal
Balance errors (of 30)			
Delayed Recall	of 5 of 10	of 5 of 10	of 5 of 10

Date and time of injury: _____

If the athlete is known to you prior to their injury, are they different from their usual self?
☐ **Yes** ☐ **No** ☐ **Unsure** ☐ **Not Applicable**
(If different, describe why in the clinical notes section)

Concussion Diagnosed?
☐ **Yes** ☐ **No** ☐ **Unsure** ☐ **Not Applicable**

If re-testing, has the athlete improved?
☐ **Yes** ☐ **No** ☐ **Unsure** ☐ **Not Applicable**

I am a physician or licensed healthcare professional and I have personally administered or supervised the administration of this SCAT5.

Signature: _____

Name: _____

Title: _____

Registration number (if applicable): _____

Date: _____

SCORING ON THE SCAT5 SHOULD NOT BE USED AS A STAND-ALONE METHOD TO DIAGNOSE CONCUSSION, MEASURE RECOVERY OR MAKE DECISIONS ABOUT AN ATHLETE'S READINESS TO RETURN TO COMPETITION AFTER CONCUSSION.

CLINICAL NOTES:

Name: _____

DOB: _____

Address: _____

ID number: _____

Examiner: _____

Date: _____

CONCUSSION INJURY ADVICE

(To be given to the person monitoring the concussed athlete)

This patient has received an injury to the head. A careful medical examination has been carried out and no sign of any serious complications has been found. Recovery time is variable across individuals and the patient will need monitoring for a further period by a responsible adult. Your treating physician will provide guidance as to this timeframe.

If you notice any change in behaviour, vomiting, worsening headache, double vision or excessive drowsiness, please telephone your doctor or the nearest hospital emergency department immediately.

Other important points:

Initial rest: Limit physical activity to routine daily activities (avoid exercise, training, sports) and limit activities such as school, work, and screen time to a level that does not worsen symptoms.

1) Avoid alcohol

2) Avoid prescription or non-prescription drugs without medical supervision. Specifically:

   a) Avoid sleeping tablets

   b) Do not use aspirin, anti-inflammatory medication or stronger pain medications such as narcotics

3) Do not drive until cleared by a healthcare professional.

4) Return to play/sport requires clearance by a healthcare professional.

Clinic phone number: _____

Patient's name: _____

Date / time of injury: _____

Date / time of medical review: _____

Healthcare Provider: _____

Contact details or stamp

INSTRUCTIONS

Words in *Italics* throughout the SCAT5 are the instructions given to the athlete by the clinician

Symptom Scale

The time frame for symptoms should be based on the type of test being administered. At baseline it is advantageous to assess how an athlete "typically" feels whereas during the acute/post-acute stage it is best to ask how the athlete feels at the time of testing.

The symptom scale should be completed by the athlete, not by the examiner. In situations where the symptom scale is being completed after exercise, it should be done in a resting state, generally by approximating his/her resting heart rate.

For total number of symptoms, maximum possible is 22 except immediately post injury, if sleep item is omitted, which then creates a maximum of 21.

For Symptom severity score, add all scores in table, maximum possible is 22 x 6 = 132, except immediately post injury if sleep item is omitted, which then creates a maximum of 21x6=126.

Immediate Memory

The Immediate Memory component can be completed using the traditional 5-word per trial list or, optionally, using 10-words per trial. The literature suggests that the Immediate Memory has a notable ceiling effect when a 5-word list is used. In settings where this ceiling is prominent, the examiner may wish to make the task more difficult by incorporating two 5–word groups for a total of 10 words per trial. In this case, the maximum score per trial is 10 with a total trial maximum of 30.

Choose one of the word lists (either 5 or 10). Then perform 3 trials of immediate memory using this list.

Complete all 3 trials regardless of score on previous trials.

"I am going to test your memory. I will read you a list of words and when I am done, repeat back as many words as you can remember, in any order." The words must be read at a rate of one word per second.

Trials 2 & 3 MUST be completed regardless of score on trial 1 & 2.

Trials 2 & 3:

"I am going to repeat the same list again. Repeat back as many words as you can remember in any order, even if you said the word before."

Score 1 pt. for each correct response. Total score equals sum across all 3 trials. Do NOT inform the athlete that delayed recall will be tested.

Concentration

Digits backward

Choose one column of digits from lists A, B, C, D, E or F and administer those digits as follows:

Say: *"I am going to read a string of numbers and when I am done, you repeat them back to me in reverse order of how I read them to you. For example, if I say 7-1-9, you would say 9-1-7."*

Begin with first 3 digit string.

If correct, circle "Y" for correct and go to next string length. If incorrect, circle "N" for the first string length and read trial 2 in the same string length. One point possible for each string length. Stop after incorrect on both trials (2 N's) in a string length. The digits should be read at the rate of one per second.

Months in reverse order

"Now tell me the months of the year in reverse order. Start with the last month and go backward. So you'll say December, November ... Go ahead"

1 pt. for entire sequence correct

Delayed Recall

The delayed recall should be performed after 5 minutes have elapsed since the end of the Immediate Recall section.

"Do you remember that list of words I read a few times earlier? Tell me as many words from the list as you can remember in any order."

Score 1 pt. for each correct response

Modified Balance Error Scoring System (mBESS)[5] testing

This balance testing is based on a modified version of the Balance Error Scoring System (BESS)[5]. A timing device is required for this testing.

Each of 20-second trial/stance is scored by counting the number of errors. The examiner will begin counting errors only after the athlete has assumed the proper start position. The modified BESS is calculated by adding one error point for each error during the three 20-second tests. The maximum number of errors for any single condition is 10. If the athlete commits multiple errors simultaneously, only one error is recorded but the athlete should quickly return to the testing position, and counting should resume once the athlete is set. Athletes that are unable to maintain the testing procedure for a minimum of five seconds at the start are assigned the highest possible score, ten, for that testing condition.

OPTION: For further assessment, the same 3 stances can be performed on a surface of medium density foam (e.g., approximately 50cm x 40cm x 6cm).

Balance testing – types of errors

1. Hands lifted off iliac crest
2. Opening eyes
3. Step, stumble, or fall
4. Moving hip into > 30 degrees abduction
5. Lifting forefoot or heel
6. Remaining out of test position > 5 sec

"I am now going to test your balance. Please take your shoes off (if applicable), roll up your pant legs above ankle (if applicable), and remove any ankle taping (if applicable). This test will consist of three twenty second tests with different stances."

(a) Double leg stance:

"The first stance is standing with your feet together with your hands on your hips and with your eyes closed. You should try to maintain stability in that position for 20 seconds. I will be counting the number of times you move out of this position. I will start timing when you are set and have closed your eyes."

(b) Single leg stance:

"If you were to kick a ball, which foot would you use? [This will be the dominant foot] *Now stand on your non-dominant foot. The dominant leg should be held in approximately 30 degrees of hip flexion and 45 degrees of knee flexion. Again, you should try to maintain stability for 20 seconds with your hands on your hips and your eyes closed. I will be counting the number of times you move out of this position. If you stumble out of this position, open your eyes and return to the start position and continue balancing. I will start timing when you are set and have closed your eyes."*

(c) Tandem stance:

"Now stand heel-to-toe with your non-dominant foot in back. Your weight should be evenly distributed across both feet. Again, you should try to maintain stability for 20 seconds with your hands on your hips and your eyes closed. I will be counting the number of times you move out of this position. If you stumble out of this position, open your eyes and return to the start position and continue balancing. I will start timing when you are set and have closed your eyes."

Tandem Gait

Participants are instructed to stand with their feet together behind a starting line (the test is best done with footwear removed). Then, they walk in a forward direction as quickly and as accurately as possible along a 38mm wide (sports tape), 3 metre line with an alternate foot heel-to-toe gait ensuring that they approximate their heel and toe on each step. Once they cross the end of the 3m line, they turn 180 degrees and return to the starting point using the same gait. Athletes fail the test if they step off the line, have a separation between their heel and toe, or if they touch or grab the examiner or an object.

Finger to Nose

"I am going to test your coordination now. Please sit comfortably on the chair with your eyes open and your arm (either right or left) outstretched (shoulder flexed to 90 degrees and elbow and fingers extended), pointing in front of you. When I give a start signal, I would like you to perform five successive finger to nose repetitions using your index finger to touch the tip of the nose, and then return to the starting position, as quickly and as accurately as possible."

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CONCUSSION INFORMATION

Any athlete suspected of having a concussion should be removed from play and seek medical evaluation.

Signs to watch for

Problems could arise over the first 24-48 hours. The athlete should not be left alone and must go to a hospital at once if they experience:

- Worsening headache
- Drowsiness or inability to be awakened
- Inability to recognize people or places
- Repeated vomiting
- Unusual behaviour or confusion or irritable
- Seizures (arms and legs jerk uncontrollably)
- Weakness or numbness in arms or legs
- Unsteadiness on their feet.
- Slurred speech

Consult your physician or licensed healthcare professional after a suspected concussion. Remember, it is better to be safe.

Rest & Rehabilitation

After a concussion, the athlete should have physical rest and relative cognitive rest for a few days to allow their symptoms to improve. In most cases, after no more than a few days of rest, the athlete should gradually increase their daily activity level as long as their symptoms do not worsen. Once the athlete is able to complete their usual daily activities without concussion-related symptoms, the second step of the return to play/sport progression can be started. The athlete should not return to play/sport until their concussion-related symptoms have resolved and the athlete has successfully returned to full school/learning activities.

When returning to play/sport, the athlete should follow a stepwise, **medically managed exercise progression, with increasing amounts of exercise.** For example:

Graduated Return to Sport Strategy

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

In this example, it would be typical to have 24 hours (or longer) for each step of the progression. If any symptoms worsen while exercising, the athlete should go back to the previous step. Resistance training should be added only in the later stages (Stage 3 or 4 at the earliest).

Written clearance should be provided by a healthcare professional before return to play/sport as directed by local laws and regulations.

Graduated Return to School Strategy

Concussion may affect the ability to learn at school. The athlete may need to miss a few days of school after a concussion. When going back to school, some athletes may need to go back gradually and may need to have some changes made to their schedule so that concussion symptoms do not get worse. If a particular activity makes symptoms worse, then the athlete should stop that activity and rest until symptoms get better. To make sure that the athlete can get back to school without problems, it is important that the healthcare provider, parents, caregivers and teachers talk to each other so that everyone knows what the plan is for the athlete to go back to school.

Note: If mental activity does not cause any symptoms, the athlete may be able to skip step 2 and return to school part-time before doing school activities at home first.

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

If the athlete continues to have symptoms with mental activity, some other accomodations that can help with return to school may include:

- Starting school later, only going for half days, or going only to certain classes
- More time to finish assignments/tests
- Quiet room to finish assignments/tests
- Not going to noisy areas like the cafeteria, assembly halls, sporting events, music class, shop class, etc.
- Taking lots of breaks during class, homework, tests
- No more than one exam/day
- Shorter assignments
- Repetition/memory cues
- Use of a student helper/tutor
- Reassurance from teachers that the child will be supported while getting better

The athlete should not go back to sports until they are back to school/learning, without symptoms getting significantly worse and no longer needing any changes to their schedule.

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Notes