

## **Concussion Policy #7515: Niagara Falls City School District**

### **Concussion Management policy for athletic training contracts with NFMCC**

The following policy is for schools, organizations, and tournaments that are under contract for athletic training services with Niagara Falls Memorial Medical Center (NFMCC) and in affiliation with UB Orthopaedics & Sports Medicine of Niagara. NFMCC employs certified athletic trainer(s) for contracted services at the school for sports medicine. This policy is based on the Summary and Agreement statement of the 4th International Conference on Concussion in Sport held in Zurich, November 2012. This conference also updated the SCAT2 form to the SCAT 3 which is now the recommended concussion evaluation tool of choice along with ImPACT (Immediate Post-Concussion Assessment and Cognitive Testing) computer testing.

This concussion policy is for students and student athletes from the Niagara Falls City School District (NFCSD) in grades K-12.

#### **Definition of concussion:**

Concussion is a mild traumatic brain injury. Concussion occurs when normal brain functioning is disrupted by a blow or jolt to the head, face, neck or elsewhere on the body with an "impulsive" force transmitted to the head. Recovery from concussion will vary. Avoiding re-injury and over-exertion until fully recovered are the cornerstones of proper concussion management.

#### **Defining the nature of a concussive head injury includes:**

1. Concussion may be caused either by a direct blow to the head, face, neck, or elsewhere on the body with an "impulsive" force transmitted to the head.
2. Concussion typically results in the rapid onset of short-lived impairment of neurologic function that resolves spontaneously.
3. Concussion may result in neuropathological changes, but the acute clinical symptoms largely reflect a functional disturbance rather than structural injury.
4. Concussion results in a graded set of clinical syndromes that may or may not involve loss of consciousness. Resolution of the clinical and cognitive symptoms typically follows a sequential course.
5. Concussion is typically associated with grossly normal structural neuro-imaging studies.

#### **Pediatric Concussive injury:**

Children, ages (5-18) years old should not be returned to playing or training until clinically completely symptom free. Because of the physiological response during childhood head trauma, a conservative return to play approach is recommended. ***It may be appropriate to extend the amount of time of asymptomatic rest and/or the length of the graded exertion in children and adolescents.*** It is not appropriate for a child or adolescent athlete with concussion to Return to Play (RTP) on the same day as the injury, regardless of the level of athletic performance. Concussion modifiers apply even more to this population than to adults and may mandate more cautious RTP advice. In addition, the concept of "cognitive rest" is highlighted, with special reference to a child's need to limit exertion with activities of daily living and to limit scholastic and other cognitive stressors (eg, text messaging, video games, etc.) while symptomatic. School attendance and activities may also need to be modified to avoid provocation of symptoms.

## **Concussion Evaluation:**

The diagnosis of acute concussion usually involves the assessment of a range of domains, including clinical symptoms, physical signs, behavior, balance, sleep, and cognition. Also, a detailed concussion history is an important part of the evaluation, both in the injured athlete and when conducting a pre-participation examination.

The suspected diagnosis of concussion can include one or more of the following clinical domains:

- a) Symptoms: somatic (eg, headache), cognitive (eg, feeling “like in a fog”) and/or emotional symptoms (eg, lability)
- b) Physical signs (eg, loss of consciousness, amnesia)
- c) Behavioral changes (eg, irritability)
- d) Cognitive impairment (eg, slowed reaction time)
- e) Sleep disturbance (eg, drowsiness)
- f) If any one or more of these components is present, a concussion should be suspected and the appropriate management strategy instituted.

## **Grading concussions:**

With concussion, an athlete suffers an injury that progressively resolves without complication over 7-10 days. Concussion represents the most common form of this injury and can be appropriately managed by primary care physicians or by certified athletic trainers working under medical supervision. Concussion management ideally is rest until all symptoms resolve and then a graded program of exertion before return to sport. All concussions mandate evaluation by a medical doctor who is comfortable in managing concussion injuries.

## **CONCUSSION MANAGEMENT:**

### **Neuro cognitive testing:**

NFCSD will implement Neuro-cognitive computer based testing. We will use the ImPACT concussion management program for baseline evaluations for NFCSD student athletes for grades 7-12. We will do post-injury evaluations with the SCAT3 form and ImPACT program as objective tools in the concussion management process to determine a safe return to play for the student athlete. NFCSD will concussion baseline test those contact sport student athletes from football, soccer, wrestling, hockey, and lacrosse. We will also baseline test athletes from boys and girls basketball and cheerleading. This will include modified, JV, and Varsity student athletes. Those athletes not participating in those above sports are able to have a concussion baseline test completed, if desired. Those student athletes that have a history of (1) prior concussion will also be required to receive a concussion baseline test from the ImPACT program.

Computer baseline testing allows us to:

- Quantify the injury with a highly sensitive measure of brain function
- Protect the athlete
- Help determine safe return to play
- Help prevent cumulative effects of multiple concussions
- Prevent lingering effects of concussion and potential catastrophic injury

## **Return to play PROTOCOL**

During the period of recovery, in the first few days following the injury, it is important to emphasize to the athlete that physical AND cognitive rest is required. Activities that require concentration and attention may exacerbate the symptoms and as a result delay recovery.

### **Pharmacological therapy:**

An important consideration in RTP is that concussed athletes should not only be symptom free, but also should not be taking any pharmacologic agents or medications that may mask or modify the symptoms of concussion. Where antidepressant therapy may be commenced during the management of a concussion, the decision to RTP while still on such medication must be considered carefully by the treating clinician.

A player should never return to play while symptomatic.

**“WHEN IN DOUBT, SIT THEM OUT!”**

## **Concussion Protocol: Niagara Falls City School District**

### **Pre-Season:**

- Prior to all sports seasons, a baseline test using the ImPACT neurocognitive computer test is performed.
- Test is administered by Certified Athletic Trainer (ATC) or the NFCSD Athletic Director.
- Each student is required to complete this test prior to the season starting.
  - If any student has not completed the Impact Test, he/she is ineligible to participate until a test has been given.
  - The test is administered in conjunction with student athletes receiving a pre-participation (PPE) examination.
- Baseline tests are repeated every other year prior to PPE's.
  - ImPACT tests are done on ALL contact sport athletes in their Freshman and Junior years of High School in addition to those student athletes that will be participating in Modified football and/ or wrestling for the NFCSD. ImPACT testing will also be done on ALL boys and girls basketball players as well as cheerleaders.
  - When ImPACT test is completed, the student athlete will bring a confirmation printout from the ImPACT program back to the school nurse for notification of completion and clearance to receive PPE.

### **In-Season:**

- In the event that an athlete suffers a mechanism of injury and/or signs and symptoms of concussion, a sideline evaluation is performed.
  - SCAT 3 will be utilized
- If it is determined that any athlete is positive for signs and symptoms of concussion, he/she is to be immediately removed from that day's contest and/or practice.
  - Student athletes are ineligible to return on the day of injury.
  - Parents/guardians are immediately contacted regarding injury.
  - Parents/guardians are given a head injury warning sheet of instructions to follow until the athlete is seen by primary care physician and/or emergency room.
  - Injury report is sent to school nurse, athletic office and guidance counselor/principal.
- Within return to school, or ASAP, a post injury ImPACT test is performed (24-48 hours post-injury is optimal time frame).

- Prior to the test, the list of signs and symptoms is reviewed by the medical professional.
  - This is done during each evaluation / re-evaluation during the recovery process.

### **Reports:**

- Once the Post injury test has been completed, NFCSD school physician, school nurse, nurse practitioner and guidance counselor/principal are informed of the injured student athlete.
- NFCSD school policy states that final release of a student to return to play is determined by the NFCSD school physician.
- Student athletes **MUST** be evaluated by their Primary Care Physician and report the injury, but the NFCSD school Physician is the one to release students for return to play.
- Once student athletes have returned to baseline level on the ImPACT test and are symptom free based on the SCAT3 evaluation, they may begin the return to play exercise progression initiated/approved by the NFCSD school physician.
- The final ImPACT post-injury report will be sent to the school physician along with completed RTP exercise progression form for interpretation and possible clearance.

### **Return To Play:**

- NFCSD follows the 2012 Zurich guidelines/concussion policy for return to play. (see Return to Play progression protocol form) (see 2012 Zurich guidelines)

The return to play following a concussion incorporates a step-by-step process:

1. No activity, complete rest. Once asymptomatic for 24 hours, proceed to levels using the following steps:
  2. Light aerobic exercise such as walking or stationary cycling, no resistance training.
  3. Sport specific exercise (Skating in hockey, running in soccer, etc.) progressive addition of resistance training at steps 3 or 4.
  4. Non-contact training drills.
  5. Full contact training and/or exertional testing after medical clearance.
  6. Return to FULL Game play.
  7. **This progression should be over 5 days for RTP without return of symptoms.**
- If a student suffers any return of symptoms during the RTP protocol, he/she must immediately stop the RTP protocol until he/she is once again symptom free.
    - Once the athlete is symptom free for 24 hours, he/she can continue with RTP process where he/she previously ended.
  - When a student completes the RTP, he/she is eligible for full release to game activity.
  - Completed RTP protocol form signed off by ATC is then sent to school physician for final approval and RTP (See Attachment A).

## **Return to Learn:**

**Stage 1**-no activity: complete cognitive rest, no school attendance no homework, reading, texting, video/computer games or computer work for recovery of the injury.

**Stage 2**-gradual re-introduction of cognitive activity: short 5-15 minutes at a time then relax to the restrictions of stage one. This gradual controlled increases the sub-symptom threshold of cognitive activities.

**Stage 3**- catch up: the student can start to catch up on some school work by completing it at home in longer increments of 20-30 minutes at a time, the increase of cognitive endurance by repetition of short periods of self-paced cognitive activity.

**Stage 4**-limited re-entry to school: finally re-entry to school for part of the day, this stage is initiated once 1-2 cumulative hours of homework has been achieved. The re-entry into school with accommodations to allow rest or a shorted day will assist in the controlled sub-symptom threshold and increased cognitive load.

**Stage 5**- full day: starts a gradual reintegration into school increasing to a full day of school and classes, accommodations decrease as cognitive endurance improves.

**Stage 6**- return to regular school activity: attendance of a full cognitive workload such as taking test and exams that were missed or currently expected, catch up with missed essential work, this is full recovery into the academic day and at this point a return to play protocol maybe initiated.

The above policy will be followed by the healthcare professionals (school physician, nurse practitioners, school nurses, athletic trainer, athletic department) who manage the return to play of student athletes at local high schools and colleges that are under contract for athletic training services with NFMCC. **This concussion management/RTP protocol will be followed despite the athlete presenting a prescription note to RTP sooner from his/her primary care physician or Emergency Room.** If an athlete presents a prescription from his/her primary care physician to their school nurse for the appropriate time frame in regards to RTP, then the exertional progressive steps will be followed by the athletic trainer when given approval to start from the NFCSD Nurse practitioners using the RTP protocol from the SCAT3 form protocol. The student athlete **MUST** see their school nurse after the injury has occurred and RTP progression **MUST** be initiated and approved by the District Nurse Practitioners prior to beginning. See attached SCAT3 form (Attachment C). NFCSD school physician **MUST** approve initiation of RTP protocol completed by school district's athletic trainer. The completed RTP protocol form (Attachment B) **MUST** be approved upon completion by the NFCSD school physician.

### **Concussion Management Team (CMT)**

This section summarizes the responsibilities of each profession of the CMT along with the student and student-athlete as well as the parent/guardian of that student. These responsibilities are explained in detail in the NYS Concussion Management and Awareness ACT that was enacted on July 1, 2012. These components are to be installed by each profession within the CMT and reviewed on an annual basis.

**Student** – Review Concussion Information Sheet. Athletes must sign signature sheet.

**Parent/Guardian** – Review District's Concussion Information Sheet. If child is an athlete, Concussion Information sheet must be signed. Parent and athlete must receive and sign concussion information in order for athlete to participate

**School Administrator/Pupil Personnel Staff** – Must share Concussion Information Sheet with parents and staff (this can be done via a letter to home for parents and an email to staff – Attachment A)

**Medical Director** – Review and complete CDC’s *Heads Up, Facts for Physicians About Mild Traumatic Brain Injury (MTBI)*, students with these conditions are at a higher risk for prolonged recovery from a concussion:

[http://www.cdc.gov/concussion/headsup/pdf/Facts\\_for\\_Physicians\\_booklet-a.pdf](http://www.cdc.gov/concussion/headsup/pdf/Facts_for_Physicians_booklet-a.pdf)

If school chooses to use ImPact, school physician must be educated through ImPact system to interpret ImPact scores.

**Private Medical Provider/Specialists (Primary Care Physician)** – If possible, review and complete CDC’s *Heads Up, Facts for Physicians About Mild Traumatic Brain Injury (MTBI)*, students with these conditions are at a higher risk for prolonged recovery from a concussion:

[http://www.cdc.gov/concussion/headsup/pdf/Facts\\_for\\_Physicians\\_booklet-a.pdf](http://www.cdc.gov/concussion/headsup/pdf/Facts_for_Physicians_booklet-a.pdf)

We ask that notes from private medical providers that clear athletes from concussions include: Clearance for RTP and an exercise progression.

**School Nurse** – Must be knowledgeable on how to evaluate concussions – ie. SCAT2 , Must complete the Department-approved course for school nurses and athletic trainers every two (2) years. NYSED has approved the course *Heads Up to Clinicians* for these professions, which is a free web-based course developed by the CDC. It is available at <http://preventingconcussions.org/>.

**Director of Physical Education And/Or Athletic Director** – Must implement/enforce concussion management program. Make sure everyone on the sports medical list has **overseen the CMT and that all “CDC heads up education” has been completed bi-annually and tracked**

#### **Certified Athletic Trainer -**

- Must complete the Department-approved course for school nurses and athletic trainers every two (2) years. NYSED has approved the course *Heads Up to Clinicians* for these professions, which is a free web-based course developed by the CDC. It is available at <http://preventingconcussions.org/>.

- In charge of bridging the concussion policy from athletics to general school population.

#### **Physical Education/Coach -**

Responsible:

Remove any student who has taken a significant blow to head or body, or presents with signs and symptoms of a head injury immediately from play because the Concussion Awareness Management Act requires immediate removal of any student believed to have sustained a concussion.

Contact the school nurse or certified athletic trainer (if available) for assistance with any student injury.

Send any student exhibiting signs and symptoms of a more significant concussion (In red below) to the nearest hospital emergency room via emergency medical services (EMS) or as per District policy.

- Symptoms of a concussion include, but are not necessarily limited to:
- Amnesia (e.g. decreased or absent memory of events prior to or immediately after the injury, or difficulty retaining new information)
- Confusion or appearing dazed
- Headache or head pressure
- Loss of consciousness
- Balance difficulty or dizziness, or clumsy movements
- Double or blurry vision
- Sensitivity to light and/or sound
- Nausea, vomiting, and/or loss of appetite

- Irritability, sadness or other changes in personality
- Feeling sluggish, foggy, groggy, or lightheaded
- Concentration or focusing problems
- Slowed reaction times, drowsiness
- Fatigue and/or sleep issues (e.g. sleeping more or less than usual)

Students who develop any of the following signs, or if the above listed symptoms worsen, must be seen and evaluated immediately at the nearest hospital emergency room:

- Headaches that worsen
- Seizures
- Looks drowsy and/or cannot be awakened
- Repeated vomiting
- Slurred speech
- Unable to recognize people or places
- Weakness or numbing in arms or legs, facial drooping
- Unsteady gait
- Dilated or pinpoint pupils, or change in pupil size of one eye
- Significant irritability
- Any loss of consciousness
- Suspicion of skull fracture: blood draining from ear, or clear fluid from nose

Inform the parents/guardians of the need for evaluation by their medical provider. The coach should provide the parents/guardians with written educational materials on concussions along with the District's concussion management policy.

Inform the PE director, certified athletic trainer, the school nurse and/or medical director of the student's potential concussion. This is necessary to ensure that the student does not engage in activities at school that may complicate the student's condition prior to having written clearance by a medical provider.

Ensure that the student diagnosed with a concussion does not participate in any athletic activities until, in conjunction with the student's physician, the PE teacher/coach has received written authorization from the medical director or their designee that the student has been cleared to participate.

Ensure that the student diagnosed with a concussion does not substitute mental activities for physical activities unless medical provider clears the student to do so (e.g. Due to the need for cognitive rest, a student should not be required to write a report if he/she is not permitted to participate in PE class by their medical provider).

Complete the Department-approved course for coaches and PE teachers every two years. NYSED has approved the course *Heads Up, Concussion in Youth Sports* for these professions, which is a free web-based course that has been developed by the CDC. It is available at [http://www.cdc.gov/concussion/HeadsUp/online\\_training.html](http://www.cdc.gov/concussion/HeadsUp/online_training.html).

**Teacher** – Must review information listed below in this section.

Students who have been diagnosed with a concussion require both physical and cognitive rest.

Cognitive rest requires that the student avoid participation in, or exposure to, activities that require concentration or mental stimulation including, but not limited to:

- Computers and video games
- Television viewing



- Texting
- Reading or writing
- Studying or homework
- Taking a test or completing significant projects
- Loud music
- Bright lights

Students transitioning into school after a concussion might need academic accommodations to allow for sufficient cognitive rest. These include, but are not necessarily limited to:

- Shorter school day
- Rest periods
- Extended time for tests and assignments
- Copies of notes
- Alternative assignments
- Minimizing distractions
- Permitting student to audiotape classes
- Peer note takers
- Provide assignments in writing
- Refocus student with verbal and nonverbal cues

More information on classroom accommodations can be found at:

<http://www.upstate.edu/pmr/healthcare/programs/concussion/classroom.php>

<http://www.nationwidechildrens.org/concussions-in-the-classroom>

[http://www.cdc.gov/concussion/pdf/TBI\\_Returning\\_to\\_School-a.pdf](http://www.cdc.gov/concussion/pdf/TBI_Returning_to_School-a.pdf)

**Guidance Counselor/School Psychologist – Same as Teacher section (above)**

**RTP Protocol Form**

Please have the appropriate professionals sign this policy and make copies for the athletic office, nurse's/MD office, and athletic training room at your school. If you do not have the professionals below or more than the lines provided at your school district, please leave those blank or add them to the below section to sign.

Policy written by Tony Surace, M.Ed., ATC:                      Date: 5/29/08  
Revised: 1/7/10  
Revised: 4/17/12  
Revised: 7/29/12  
Revised: 6/17/13

Director of Sports Medicine at NFMMC/ affiliated with UB Orthopaedics & Sports Medicine of Niagara  
Niagara Falls City School District: Section VI Concussion Management Team 2013

School Superintendent: \_\_\_\_\_ Date: \_\_\_\_\_

School Physician: \_\_\_\_\_ Date: \_\_\_\_\_

Athletic Director: \_\_\_\_\_ Date: \_\_\_\_\_

School Nurse Practitioner: \_\_\_\_\_ Date: \_\_\_\_\_

School Nurse: \_\_\_\_\_ Date: \_\_\_\_\_

School Nurse: \_\_\_\_\_ Date: \_\_\_\_\_

School Nurse: \_\_\_\_\_ Date: \_\_\_\_\_

School Nurse: \_\_\_\_\_ Date: \_\_\_\_\_

Certified Athletic Trainer: \_\_\_\_\_ Date: \_\_\_\_\_

Certified Athletic Trainer: \_\_\_\_\_ Date: \_\_\_\_\_

Guidance Counselor: \_\_\_\_\_ Date: \_\_\_\_\_

NF School Board President: \_\_\_\_\_ Date: \_\_\_\_\_

## Concussion Management Return to Play Protocol

Athlete \_\_\_\_\_ DOB \_\_\_\_\_ Phone \_\_\_\_\_ Grade \_\_\_\_\_ PCP \_\_\_\_\_

Coach \_\_\_\_\_ School \_\_\_\_\_ Sport Mod/JV/V \_\_\_\_\_

MOI \_\_\_\_\_

### Functional exercise at each Stage of Rehabilitation

Date of Concussion Injury: \_\_\_\_\_

Date Athlete became asymptomatic: \_\_\_\_\_

**Check box when each phase is completed and if no return of symptoms**

No activity (Complete physical and cognitive rest (Recovery) # of days \_\_\_\_\_ Date: \_\_\_\_\_)

Day 1: Light aerobic exercise for 20 minutes (Walking, swimming, or stationary cycling, keeping intensity to < 70% of maximum predicted heart rate; no resistance training) (Increase heart rate) **Date started:** \_\_\_\_\_ (**Activity done:** \_\_\_\_\_)

Day 2: Sport specific exercise for 30 minutes (Skating drills in ice hockey, running drills in soccer, no head impact activities (Add movement) **Date:** \_\_\_\_\_ (**Activity done:** \_\_\_\_\_)

Day 3: Non-contact training drills for 40 minutes (Progression to more complex training drills, ie. passing drills in football and ice hockey; may start progressive resistance training) (Exercise, coordination, and cognitive load)  
**Date:** \_\_\_\_\_ (**Activity done:** \_\_\_\_\_)

Day 4: Full contact practice for full length of practice (Following medical clearance, participate in normal training activities) (Restore athlete's confidence; coaching staff assesses functional skills)  
**Date:** \_\_\_\_\_ (**Activity done:** \_\_\_\_\_)

Day 5: Return to play (Normal game play) **Date Ended:** \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

ATC : \_\_\_\_\_ Print Name: \_\_\_\_\_ Date: \_\_\_\_\_

School Physician: \_\_\_\_\_ Print Name: \_\_\_\_\_ 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?

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<sup>2</sup>. 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<sup>1</sup>. 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)

<b>Best eye response (E)</b>	
No eye opening	1
Eye opening in response to pain	2
Eye opening to speech	3
Eyes opening spontaneously	4
<b>Best verbal response (V)</b>	
No verbal response	1
Incomprehensible sounds	2
Inappropriate words	3
Confused	4
Oriented	5
<b>Best motor response (M)</b>	
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
<b>Glasgow Coma score (E + V + M)</b>	<b>of 15</b>

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

### 2 Maddocks Score<sup>3</sup>

"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
<b>Maddocks score</b>	<b>of 5</b>	

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 exercise.

## 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)<sup>4</sup>

**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
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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<sup>5</sup>**

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<sup>6,7</sup>**

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<sup>4</sup>

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  $22 \times 6 = 132$ .

## SAC<sup>4</sup>

### 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<sup>5</sup>

This balance testing is based on a modified version of the Balance Error Scoring System (BESS)<sup>5</sup>. 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<sup>6,7</sup>

*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.
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