

Brain Care Centre

TM

Concussion Management & ImPACT[®] Program

Pilot Season with Edmonton Minor Hockey Association

June – November 2012

This program was made possible through a generous donation by the Honorable Order of the Blue Goose, International, Edmonton Pond.



Concussion Management & ImPACT Program: Pilot Year with EMHA

June 2012 – November 2012

Participating Teams:

	Team	Date Tested	Number of Athlete's Tested
1.	CAC Midget AAA	October 3, 2012*	20
2.	CAC Bantam AAA	October 14, 2012	19
3.	Female Bantam AAA	October 17, 2012	16
4.	REM 15 Midget AA	October 24, 2012*	13
5.	CAC Midget AA	October 25, 2012*	13
6.	KC PATS Midget AAA	October 30, 2012	20
7.	South Side AC Midget AAA <i>Minor</i>	October 30, 2012	18
8.	KC PATS Midget AA <i>Major</i>	November 2, 2012	15
9.	NAIT Men's	October 15, 2012	24
10.	NAIT Women's	October 15, 2012	25

Total number of athlete's tested: **183**

*Presentation done on different day

Pilot Year Process:

- Ashley Brosda (Service Coordinator) and Carolyn Biron (Intake Coordinator) used an afternoon to create a roll-out plan for the ImPACT project.
- Ashley, Carolyn, Barb (Sport Medicine Council of Alberta), and Lacey (AHS Injury Prevention) created Sport Concussion Management and Sport Concussion Management & ImPACT powerpoint presentations. The goal is toward standardized content that can be used by all three agencies.
- Consulted a number of times with Dr. Martin Mrazik (neuropsychologist) who did a similar program in 2011, which included concussion management education and ImPACT baseline testing.
- Dr. Cummings connected with Linda (Director, NAIT Athletics) to access computer lab time at NAIT for baseline testing and providing presentations and testing to NAIT's women's and men's hockey teams.
- Consulted with Dean Hengel (General Manager, EMHA) about appropriate group to pilot program to. Dean advised that Midget (15-17 yrs) involved in A, AA, and AAA would be the best group as they have the most ice time, which would make their risk of concussion greater than other groups. Teams at these levels also have a greater degree of organization, resources, and interest in hockey best practices.
- Denise (Office Supervisor, NAIT Athletics) booked computer labs on dates and times specified by Ashley.
- Ashley and Carolyn confirmed with Dr. Naidu that his Sport Concussion Clinic at Healthpointe would be a service available to concussed athletes needing follow-up care and re-testing.
- Ashley sent Dean Hengel and Betty Chmilar (President, EMHA) letter (Appendix A) outlining program proposal for 2012-2013 hockey season. Dean distributed the letter to athletic trainers and coaches of the aforementioned levels with Ashley's contact information.

- Ashley and Carolyn presented ImPACT program information at a Concussion Seminar hosted by the EMHA with various presenters. (Sept. 10/12)
- Ashley received emails and phone calls from various EMHA athletic clubs for education and baseline testing. The Canadian Athletic Club (CAC) was the first to respond and provided the most teams for participation. Because of the response from the CAC, Ashley and Carolyn decided to include their Bantam team that wanted to participate.
- Coaches/AT's either booked the presentation and testing separately, using space provided by the CAC for the presentation and the NAIT computer lab for the testing, or booked the presentation and testing all at once, using the NAIT computer lab for both. Some coaches/AT's made the presentation and testing mandatory for their teams, while others did not. As well, some requested that parents attend, while others did not.

ImPACT Online

- 500 baseline tests, 150 post-injury tests were purchased online under the organization *Brain Care Centre and EMHA*; Expire August 17, 2013.
- Three organizational administrators: Brain Care Centre (ashley@braincarecentre.com), Healthpointe Sport Concussion Clinic (Dr. Naidu), and Dr. Mrazik.
 - Link: www.impacttest.com
- Baseline testing facilitators should take the Introduction to ImPACT webinar offered on the website.
- Other useful website resources: ImPACT best practices PDF, technology requirements document, FAQ's, and group testing powerpoint.
- Baseline testing link: www.impacttestonline.com/testing
- Demo baseline test link: www.impacttestonline.com/impacttestdemo

Concussion Management Presentation and ImPACT Testing

Prerequisites:

- After coach/AT contacted SC (Ashley), SC would arrange a date/time for presentation and offer pre-scheduled lab times for testing. If pre-scheduled lab times did not work for the team, coach/AT would propose time, SC would see if staff facilitator (or self) was available, email Denise to book lab, and contact coach/AT once the lab space was confirmed.
- SC would email a copy of the presentation (Appendix B), flow chart of service if concussed (Appendix C), and NAIT map to coach/AT.
- If presentation and testing were done separately, facilitating SC would bring copies of the presentation, flowchart of service if concussed, and NAIT map for all attendees. Facilitating SC would also bring a 'Coach/AT package', which included a copy of the presentation, flowchart of service if concussed, NAIT map, SCAT2 (Appendix D), Healthpointe Clinic referrals (Appendix E) x 10 copies, and SC (Ashley)'s business card. Facilitating SC would have extra copies of 'Return to Play Guidelines' for specific requests, which will eventually be a handout in the coach/AT package once revised.
- If presentation and testing were done together, facilitating SC would bring all the same handouts except for the NAIT map.

Setup:

- Facilitating SC Responsibilities:
 - Posting direction signs in NAIT and "ImPACT Testing" sign outside of computer lab.
 - Setting up written sign-in sheet (Appendix F) on table with a pen.
 - Writing ImPACT website, baseline code, guidelines, and FAQs (Appendix G) on white board.
 - Setting up powerpoint presentation (if applicable) and have copies available for parents or athletes (if applicable).
 - Turning on and logging on to at least 25 computers.
 - If there's extra time...
 - Make sure pop-up blocker is turned off
 - Log onto ImPACT website (do not enter code)

Presentation

- Takes approximately 30 minutes (without audience questions).
- Slides including speaker's notes are in the Concussion Management Presentation binder.

ImPACT Testing

- Takes approximately 25-40 minutes.
- Facilitating SC Responsibilities:
 - Verbally remind athletes to make sure pop-up blocker is turned off, what the guidelines are, and what the FAQ's are.
 - Have athletes enter the code on the ImPACT testing website.
 - Ensure athletes are extremely quiet once the actual testing begins. Light chatter is permitted during demographic questionnaire and symptom scale report.
 - Once all students are finished, exit out of any running programs and log off computers.
 - Ensure computer lab door is locked when leaving.

Appendix



Brain Care Centre

TM

September 4, 2012

To Whom it May Concern,

Brain Care Centre is a non-profit organization that supports individuals with an acquired brain injury in the community. This year, Brain Care Centre was funded to acquire and administer Immediate Post-Concussion Assessment and Testing (ImPACT) assessments.

Our agency is pleased to extend an invitation for your team to participate in a pilot project that will serve to provide education and pre-season ImPACT assessments to all players on your team. In future, it is planned that this program will be available to all athletes participating in minor hockey, however, for this first year it has been decided that athletes registered in Midget AAA/AA/A levels will be invited to take part. The program will require that parents, athletes, and coaches be available for a 30 minute presentation on concussions and concussion management. This session will further outline the process that parents and athletes are to follow in order to ensure safe return to play.

Should you have any other questions at this time, please do not hesitate to contact me.

Sincerely,

Ashley Brosda B.Ed
Service Coordinator


ashley@braincarecentre.com
780-477-7575 ext 22

Sport Concussion Management & ImPACT®

Alberta Health Services Brain Care Centre SMCA


Today We Will Talk About...

- Concussion physiology, prevalence, and challenges
- What to do if a concussion is suspected
- Protocol when returning back to play
- ImPACT™ Assessment



"I don't think it's a concussion ... although the smoko has no a little concussed."

A Real-Life Example...



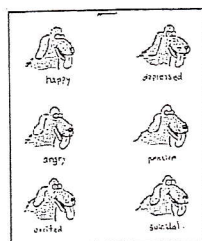
Stats

- 2432 concussions diagnosed in Emergency Departments across Edmonton in 2010.
 - 2/3 were male
- 85-90% of individuals that experience concussion recover fully within a 7-10 day window

The Challenge of Concussion

- Injuries are mild, subtle, and sometimes difficult to detect.
- Many myths and misconceptions around concussion.
- Return-to-play decisions can have huge implications on the outcome of the game.

To Tell or Not To Tell?



How to recognize the moods of an *injured* soccer ...or of an injured athlete

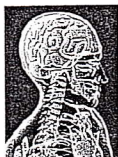
Physiology

- A concussion...
 - ...Is a brain injury that changes normal brain function.
 - ...Can result WITH or WITHOUT a loss of consciousness.



Mechanism

- When an athlete is moving at a high rate of speed and collides with another object, the brain shifts inside the skull and strikes to bony surfaces.



Physiology

- When you experience a hit to the head, there is a chemical imbalance in your brain.
- The chemical imbalance makes your brain more sensitive to any increased stress or injury until you have fully recovered.
- If you return to play while these chemicals are out of balance, there are potential (and possibly life-threatening) long-term consequences.
- It typically takes 7-10 days for your brain to return to its original state.

Signs & Symptoms of Concussion

- Headache
- Dizziness
- Ringing in ears
- Blurry or double vision
- Feeling "slowed down" or "dazed"
- Sensitivity to light and sound
- Difficulty concentrating
- Difficulty with balance maneuvers
- General confusion
- Difficulty orienting to time and place

Managing Suspected Concussions

- Concussion should be suspected in the presence of **ANY ONE SIGN OR SYMPTOM**.
 - The signs and/or symptoms may vary for each athlete.
- The athlete should be pulled from game play immediately.
- It is critical to watch for signs of deteriorating brain function, which may even be delayed.

Signs of Deteriorating Brain Function

- Athletes need to be carefully monitored for the first 24-48 hours.
- If any of the below symptoms occur, refer them **immediately** to the emergency department:
 - Headaches that worsen
 - Seizures
 - Looks drowsy or can't be awakened
 - Repeated vomiting
 - Slurred speech
 - Cannot recognize people or places
 - Increased confusion; Unusual behavior change; Irritability
 - Weakness or numbness in arms or legs
 - Neck pain



Managing Suspected Concussions

Deterioration of Brain Functioning	Suspected Neck Injury	NO Deterioration of Brain Functioning
<ul style="list-style-type: none"> Immediately refer to Emergency Department 	<ul style="list-style-type: none"> Immediately refer to Emergency Department 	<ul style="list-style-type: none"> Remove player from game Monitor signs & symptoms DO NOT give any medications Inform caregiver Be evaluated by a medical doctor ASAP

When in doubt, sit them out!

Return to Play Guidelines

- Step 1
 - No activity, complete rest.
 - Once no longer feeling any symptoms and have been seen by medical doctor, go to step 2.
- Step 2
 - Light exercise such as walking or stationary cycling.
 - 10-15 minutes at a time.
- Step 3
 - Sport specific aerobic activity (i.e. skating).
 - 20-30 minutes at a time. NO CONTACT.
- Step 4
 - "On field" practice (i.e. ball drills, shooting drills)
 - NO CONTACT.
- Step 5
 - Cleared from medical doctor to participate in "on field" practice.
 - Full contact. Post-concussion cognitive testing (i.e. IMPACT), if applicable.
- Step 6
 - Game play.

Return to Play Guidelines

- Each step should take a minimum of one day.
- If the athlete experiences any symptoms of concussion that come back, either with activity or later that day, should stop the activity immediately and rest until symptoms resolve (min of 24 hours).
- Will be individual to the athlete and their injury.

Why Concussion Protocol is Important

- Prolonged symptoms
- Second Impact Syndrome


What You Can Do

- Physical Rest
 - Follow 'Return to Play' guidelines
- Cognitive Rest
 - Refrain from and/or limit activities that require mental strain:
 - Using the computer
 - Watching TV
 - Reading
 - Playing video games
- Discuss a 'Rest' plan with your doctor

Tools To Aide In Returning to Play

- SCAT2
 - Sport Concussion Assessment Tool
 - Sideline assessment administered immediately after hit to the head
- ImPACT
 - Immediate Post-Concussion Assessment and Cognitive Testing
 - Tool that can help determine cognitive or 'brain' readiness when returning to play

Questions or Comments?



Alberta Health Services Brain Care Centre SMCA

References

- Mrazik, M. (2012) *Sport Concussion*. Presentation.
- Valovich McLeod, T.C. & Gioia, G.A. (2010). *Cognitive rest: The often neglected aspect of concussion management*; A.T. Still University Children's National Medical Center, 2010 Human Kinetics - ATT 15(2), pp. 1-3.
- ThinkFirst Canada (2012). *Return to play guidelines*. http://www.thinkfirst.ca/programs/documents/TF_Concussion_QAcoachtrainer_E_2012.pdf
- Matheson, J. (2012). *Oilers won't rush Taylor Hall back into lineup after concussion*. Edmonton Journal, March 19, 2012.
- *PBS News: Second Impact Syndrome*, <http://www.youtube.com/watch?v=V12Zqmd3Btc>
- *Taylor Hall and Corey Sarich* [Phhttp://www.youtube.com/watch?v=wttzK-Q_Frk](http://www.youtube.com/watch?v=wttzK-Q_Frk)

Online Resources

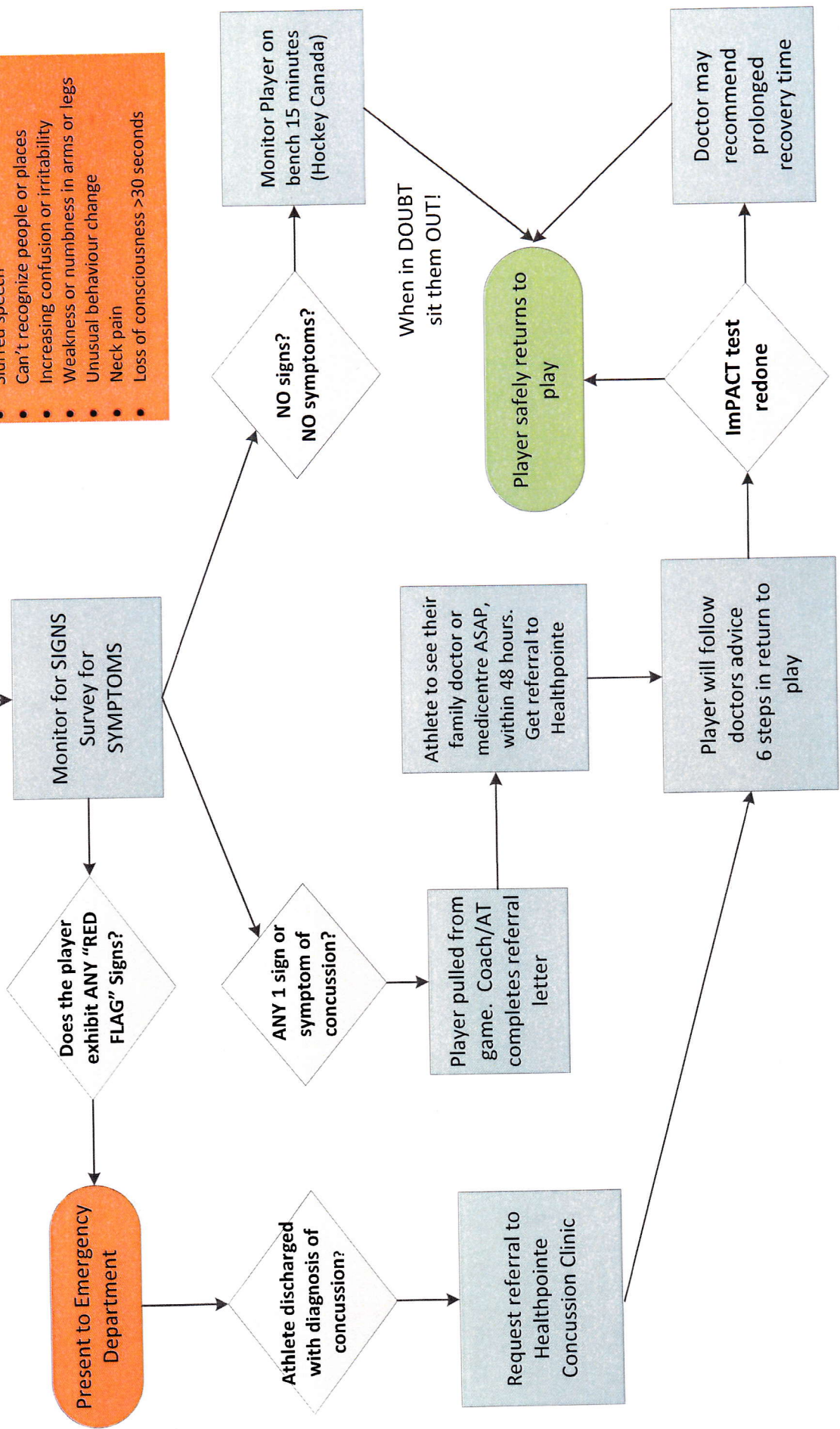
- Hockeycanada.ca → Hockey Programs → Concussion Prevention
- Thinkfirst.ca
- Brainline.org → TBI Topics → Concussion/Mild TBI
- Sportmedab.ca → Resources → Sport Concussion

RED FLAG Signs of Deteriorating Brain Function

- Headaches that worsen
- Seizures
- Looks very drowsy or can't be awakened
- Repeated vomiting
- Slurred speech
- Can't recognize people or places
- Increasing confusion or irritability
- Weakness or numbness in arms or legs
- Unusual behaviour change
- Neck pain
- Loss of consciousness >30 seconds

Player is hit with head contact or significant whiplash

Brain Care Centre™



SCAT2



FIFA®



Sport Concussion Assessment Tool 2

Name _____

Sport/team _____

Date/time of injury _____

Date/time of assessment _____

Age _____ Gender M F

Years of education completed _____

Examiner _____

What is the SCAT2?

This tool represents a standardized method of evaluating injured athletes for concussion and can be used in athletes aged from 10 years and older. It supersedes the original SCAT published in 2005². This tool also enables the calculation of the Standardized Assessment of Concussion (SAC)^{3,4} score and the Maddocks questions⁵ for sideline concussion assessment.

Instructions for using the SCAT2

The SCAT2 is designed for the use of medical and health professionals. Preseason baseline testing with the SCAT2 can be helpful for interpreting post-injury test scores. Words in *italics* throughout the SCAT2 are the instructions given to the athlete by the tester.

This tool may be freely copied for distribution to individuals, teams, groups and organizations.

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 symptoms (like those listed below) and often does not involve loss of consciousness. Concussion should be suspected in the presence of **any one or more** of the following:

- Symptoms (such as headache), or
- Physical signs (such as unsteadiness), or
- Impaired brain function (e.g. confusion) or
- Abnormal behaviour.

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.

Symptom Evaluation

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 (if applicable)	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 _____

(Add all scores in table, maximum possible: 22 x 6 = 132)

Do the symptoms get worse with physical activity? Y N

Do the symptoms get worse with mental activity? Y N

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

Cognitive & Physical Evaluation

1 Symptom score (from page 1)
22 minus number of symptoms of 22

2 Physical signs score
Was there loss of consciousness or unresponsiveness? Y N
If yes, how long? minutes
Was there a balance problem/unsteadiness? Y N
Physical signs score (1 point for each negative response) of 2

3 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
Obey commands 6

Glasgow Coma score (E + V + M) of 15
GCS should be recorded for all athletes in case of subsequent deterioration.

4 Sideline Assessment – Maddocks Score
"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)

At 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 included in SCAT 2 summary score for serial testing.

5 Cognitive assessment
Standardized Assessment of Concussion (SAC)

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
"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.

List	Trial 1	Trial 2	Trial 3	Alternative word list
elbow	<input type="text"/>	<input type="text"/>	<input type="text"/>	candle baby finger
apple	<input type="text"/>	<input type="text"/>	<input type="text"/>	paper monkey penny
carpet	<input type="text"/>	<input type="text"/>	<input type="text"/>	sugar perfume blanket
saddle	<input type="text"/>	<input type="text"/>	<input type="text"/>	sandwich sunset lemon
bubble	<input type="text"/>	<input type="text"/>	<input type="text"/>	wagon iron insect
Total	<input type="text"/>	<input type="text"/>	<input type="text"/>	

Immediate memory score of 15

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.

Alternative digit lists

4-9-3	<input type="text"/>	<input type="text"/>	6-2-9	5-2-6	4-1-5
3-8-1-4	<input type="text"/>	<input type="text"/>	3-2-7-9	1-7-9-5	4-9-6-8
6-2-9-7-1	<input type="text"/>	<input type="text"/>	1-5-2-8-6	3-8-5-2-7	6-1-8-4-3
7-1-8-4-6-2	<input type="text"/>	<input type="text"/>	5-3-9-1-4-8	8-3-1-9-6-4	7-2-4-8-5-6

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

Concentration score of 5

¹ This tool has been developed by a group of international experts at the 3rd International Consensus meeting on Concussion in Sport held in Zurich, Switzerland in November 2008. The full details of the conference outcomes and the authors of the tool are published in British Journal of Sports Medicine, 2009, volume 43, supplement 1. The outcome paper will also be simultaneously co-published in the May 2009 issues of Clinical Journal of Sports Medicine, Physical Medicine & Rehabilitation, Journal of Athletic Training, Journal of Clinical Neuroscience, Journal of Science & Medicine in Sport, Neurosurgery, Scandinavian Journal of Science & Medicine in Sport and the Journal of Clinical Sports Medicine.

² McCrory P et al. Summary and agreement statement of the 2nd International Conference on Concussion in Sport, Prague 2004. British Journal of Sports Medicine. 2005; 39: 196-204

³ McCrea M. Standardized mental status testing of acute concussion. Clinical Journal of Sports Medicine. 2001; 11: 176-181

⁴ McCrea M, Randolph C, Kelly J. Standardized Assessment of Concussion: Manual for administration, scoring and interpretation. Waukesha, Wisconsin, USA.

⁵ Maddocks DL; Dicker, GD; Saling, MM. The assessment of orientation following concussion in athletes. Clin J Sport Med. 1995;5(1):32-3

⁶ Guskiewicz KM. Assessment of postural stability following sport-related concussion. Current Sports Medicine Reports. 2003; 2: 24-30

6

Balance examination

This balance testing is based on a modified version of the Balance Error Scoring System (BESS)⁶. A stopwatch or watch with a second hand is required for this testing.

Balance 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.

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

Condition	Total errors
Double Leg Stance (feet together)	of 10
Single leg stance (non-dominant foot)	of 10
Tandem stance (non-dominant foot at back)	of 10
Balance examination score (30 minus total errors)	of 30

7

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). 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 as quickly and as accurately as possible."

Which arm was tested: Left Right

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.

Coordination score

of 1

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Cognitive assessment

Standardized Assessment of Concussion (SAC)

Delayed recall

"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."

Circle each word correctly recalled. Total score equals number of words recalled.

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

Delayed recall score

of 5

Overall score

Test domain	Score
Symptom score	of 22
Physical signs score	of 2
Glasgow Coma score (E + V + M)	of 15
Balance examination score	of 30
Coordination score	of 1
Subtotal	of 70
Orientation score	of 5
Immediate memory score	of 5
Concentration score	of 15
Delayed recall score	of 5
SAC subtotal	of 30
SCAT2 total	of 100
Maddocks Score	of 5

Definitive normative data for a SCAT2 "cut-off" score is not available at this time and will be developed in prospective studies. Embedded within the SCAT2 is the SAC score that can be utilized separately in concussion management. The scoring system also takes on particular clinical significance during serial assessment where it can be used to document either a decline or an improvement in neurological functioning.

Scoring data from the SCAT2 or SAC 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.

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. You should not be left alone and must go to a hospital at once if you:

- Have a headache that gets worse
- Are very drowsy or can't be awakened (woken up)
- 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 your 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 follow a stepwise symptom-limited program, with stages of progression. For example:

1. rest until asymptomatic (physical and mental rest)
2. light aerobic exercise (e.g. stationary cycle)
3. sport-specific exercise
4. non-contact training drills (start light resistance training)
5. full contact training after medical clearance
6. return to competition (game play)

There should be approximately 24 hours (or longer) for each stage and the athlete should return to stage 1 if symptoms recur. Resistance training should only be added in the later stages.

Medical clearance should be given before return to play.

Tool	Test domain	Time	Score			
	Date tested					
	Days post injury					
SCAT2	Symptom score					
	Physical signs score					
	Glasgow Coma score (E + V + M)					
	Balance examination score					
	Coordination score					
SAC	Orientation score					
	Immediate memory score					
	Concentration score					
	Delayed recall score					
	SAC Score					
Total	SCAT2					
Symptom severity score (max possible 132)						
Return to play			<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N

Additional comments

Concussion injury advice (To be given to 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. It is expected that recovery will be rapid, but 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 telephone the clinic or the nearest hospital emergency department immediately.

Other important points:

- Rest and avoid strenuous activity for at least 24 hours
- No alcohol
- No sleeping tablets
- Use paracetamol or codeine for headache. Do not use aspirin or anti-inflammatory medication
- Do not drive until medically cleared
- Do not train or play sport until medically cleared

Patient's name

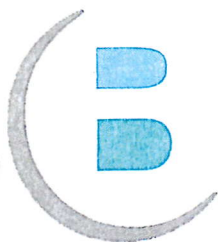
Date/time of injury

Date/time of medical review

Treating physician

Contact details or stamp

Clinic phone number



Brain Care Centre

To Whom It May Concern,

This athlete is participating in a Concussion Management program sponsored by Brain Care Centre, which included pre-season baseline cognitive testing using ImPACT™ (Immediate Post-Concussion Assessment & Cognitive Testing). By participating in this program, this athlete is able to receive post-concussion medical care and ImPACT™ re-testing at Healthpointe's sport concussion clinic in order to return to play.

Attached is a referral form from the clinic at Healthpointe so this athlete may access this service.

Thank you for partnering with us in this athlete's care.

Sincerely,

Ashley Brosda B.Ed
Service Coordinator

ashley@braincarecentre.com
780-477-7575 ext 22

Athlete Name: _____ Date _____

Parents/Guardian Name: _____

Team: _____

Coach Name: _____

Athletic Trainer/Medical Representative Name: _____



Pain Spine Sport Medicine

P: (780) 453-5255

F: (780) 453-9099

Add patient demographic label here

DATE of APPT: _____

Sport: _____

Occupation/Grade _____

Date of Suspected Concussion: _____

How many concussions have you had in your life?
(not including this one) _____

Did you vomit more than once: Yes No

What were the main symptoms immediately after your concussion?

What symptoms do you have now?

Did you go to Emergency? Yes No

Have you seen a medical doctor? Yes No Name: _____

Do you have a family physician? Yes No Name: _____

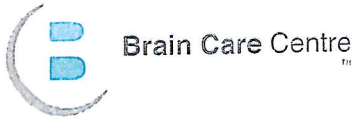
Have you had a CT Scan or MRI of your brain? Yes No

Do you have neck pain? Yes No

Do you have balance problems? Yes No

Do you have a history of (check all that apply)

- Migraine headaches
- Family history of migraine headaches
- Depression or other mental health issues
- Attention Deficit Disorder (ADD or ADHD)
- Learning disabilities (i.e. dyslexia)
- Being on stimulant medications (i.e. Ritalin, Dexedrine, Adderall, etc.)



ImPACT™ Testing Sign-In

	First and Last Name	Team
1		
2		
3		
4		
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12		
13		
14		
15		
16		
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25		

To be written on whiteboard or included as slide in powerpoint (would have to be left on during testing).

www.impacttestonline.com/testing & current code

ImPACT Testing Guidelines:

- Read the directions carefully for each sub-test.
- Work as quickly and as accurately as possible.
- Look only at your screen.
- Raise your hand and wait quietly if you have a question.
- Turn cell phones to silent or off.
- When you're finished, leave the screen up (don't exit), don't print, and leave the room quietly.

Bolded Note:

- Make sure pop-up blocker is turned OFF
 - Tools → Pop-up Blocker → Turn pop-up blocker off

FAQ's

- Handedness = Hand that you write with
- Current Position/Event/Class = Position you usually play (e.g. defense)
- Years of Education Completed = The grade you were in last year
- Dates of Previous Concussions → Your best guess
- Concussion Symptom Scale → 1=mild; 6=severe