

Concussion Protocol

Coaches Guide



When in doubt, sit them out!

Dear Minnesota Hockey Coaches,

Throughout the past year, there has been much talk throughout the sports community regarding the seriousness of concussions at all levels of play. Most notably, a report was published showing that NFL players who have suffered repeat concussions are two-times more likely to have long-term memory problems than the average person. Following this report, professional sports organizations have begun implementing guidelines for their players, as well as the NCAA and MSHSL.

In October, 2010, USA Hockey, the International Ice Hockey Federation, and other organizations came together to sponsor the *Mayo Clinic Sports Medicine Center Ice Hockey Summit: Action on Concussion*. During this summit, much was discussed regarding the seriousness of concussions, protections, signs and symptoms, and return to play protocol. Concussions are a very serious injury, and if not treated properly can lead to lifelong brain damage.

The following protocol was designed in order for coaches to properly recognize and treat a concussion. If at any time you would like a presentation made to your players or parents regarding concussions and concussion management, please do not hesitate to ask.

This packet includes:

- Minnesota Hockey Concussion Protocol
- Coaches Clipboard: Signs and Symptoms of a Concussion
- Reporting Documents
- Pocket SCAT2 Test
- Full SCAT2 Test

If at anytime you have questions, please do not hesitate to contact me.

Sincerely,

Hal Tearse
Chairman, MN Hockey Safety Committee
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Concussion Protocol

Minnesota Hockey

Minnesota Hockey encourages its coaches to follow the following protocol to ensure the safety of all players. Please direct any questions relating to this protocol to your local Concussion Manager, one of the resources listed below, or a member of the MN Hockey Safety Committee. *These protocols have been designed following the recommendations of the "3rd International Conference on Concussion in Sport (Zurich, 2008)" and the "Mayo Clinic Sports Medicine Center Ice Hockey Summit: Action on Concussion (Rochester, MN, 2010)".*

Coaches Training and Education

- Go through a training course on signs and symptoms of a concussion. The following are acceptable training courses:
 - Association seminar
 - Online webinar found here: http://www.cdc.gov/concussion/HeadsUp/online_training.html
- Have full knowledge of the association protocols and association reporting requirements relating to head injuries and concussions.
- Be fully capable of assessing a player for a concussion on the ice, off the ice, and in the locker room. *When in doubt, sit them out!*
- Keep at least one blank copy of the Concussion Reporting forms in their coaches bag at all times.

Head Injury During a Team Event

- When a player suffers a head injury, the coaches should be aware of the player's actions, and observe how they act when coming off the ice and on the bench.
- If a player is showing any visual, neurological, or complaining of any signs or symptoms of a concussion, coaches should immediately thoroughly check the player for a concussion using the proper methods. *Coaches may appoint a parent, who must also go through the training, to assess for a concussion.*
- If the player passes the concussion test without showing any physical or neurological signs of a concussion, they may return to play immediately. However, if there is any doubt whatsoever about if the player suffered a concussion, the player should not be allowed back on the ice, and coaches should begin the reporting process.
- If the possible concussion happened during a game or official scrimmage, it should be noted by the coach on the score sheet that there is a possibility of a concussion.
- Coaches are allowed to call 9-1-1 free of charge. *You do not need parental approval to do so.* Once the ambulance arrives, it is at the discretion of the parents if they want their child to go on the ambulance or not.

Reporting Procedures

1. Immediately following the possibility of a concussion, the coach shall complete their portion of the "Concussion Report" and give the parents the "Physicians Report – Concussion Determination" form. Players must go see a

physician. *No player is allowed back on the ice until they have either (a) been told by medical personnel that they did not suffer a concussion or (b) properly followed the "Return to Play" protocol.*

- a. Coaches shall call the Concussion Manager within 24 hours of the possible concussion to report the injury, and also hand deliver, mail, or e-mail the "Coaches Report" to the Concussion Manager within 24 hours of the injury.
 - b. Once the reporting process has begun, players will not be allowed back on the ice until proper approval from the Concussion Manager, *even if cleared by medical personnel.*
2. Players must go see proper medical personnel and have them complete the "Physicians Report – Concussion Determination". If the player took the ImPact test, they must also submit a copy of the results.
- a. A copy of this report and ImPact results must be hand delivered, mailed, or e-mailed to the Concussion Manager immediately following the appointment.
 - b. If the physician concluded that the player did not suffer a concussion, return the proper paperwork to the Concussion Manager immediately and the player may return to play.
 - c. If the player did suffer a concussion, please see "Return to Play" protocols and continue the reporting procedures.
3. (See "Return to Play" protocol for more information) After the first seven days and the player has been symptom free for 24 hours, players are required to see medical personnel and complete the "Physicians Report – Symptom Checkup". If the player had taken the ImPact test, please retake the test and also include these scores.
- a. A copy of this report and ImPact results must be hand delivered, mailed, or e-mailed to the Concussion Manager immediately following the appointment.
 - b. If the player is found to be 100% symptom free, they may begin the "Return to Play – Post Symptom" protocol.
 - c. If the player is found to still be suffering from concussion symptoms, they must continually be rechecked, no more than once every three (3) days before beginning the "Return to Play – Post Symptom" protocol. *Every time a player sees medical personnel for their return to play checkup, the form must be completed and sent in.*
4. Once the player has properly completed the Return to Play protocol, and is 100% symptom free, they are to go in for their final checkup with medical personnel and receive a "Return to Play" prescription and send into the Concussion Manager. A copy of the reports will be kept on file with the association and a copy will be made available to the parents and coaches.

Return to Play Protocol

The following Return to Play Protocol shall be adhered to after a player has been diagnosed with a concussion. This protocol has been designed to ensure players have properly recovered after a traumatic brain injury.

Day 1 through Day 7 following concussion: The player shall refrain from all physical activity, including on-ice, off-ice, and also physical education class. Physical activity is strictly prohibited. Depending on the severity of the concussion and symptoms, players should refrain from brain-intensive activities (ie. Reading, computer use, video games, school exams, etc...). Please check with your physician in regards to the severity of the concussion. *These rules are to be followed for a minimum of seven days, or until 100% symptom free, whichever is greater.*

Day 8 and symptom free for 24 hours: After the player has waited seven days, they are to be symptom free for 24 hours before beginning the following:

Day 8 & 9: Light aerobic exercise (5-10 minutes). This exercise should not increase the player's heart rate drastically, but merely get the player moving again. Activities such as a walk around the neighborhood are a way for light aerobic exercise. No weights or jumping is permitted.

Day 10 & 11: Add activities that increase a player's heart rate and incorporate limited body and head movement. Activities such as jogging, brief run, stationary bike, or very small weights are examples of what players should do.

Day 12 & 13: Heavy non-contact physical activity. Players are allowed back on the ice, however no contact is allowed whatsoever. *If teams do not have practice ice two days in a row, players should go for a long run, hard bike-ride, or find another team to skate with.*

Day 14 & 15: Reintegrate into full practices. Coaches must be aware of player behavior on ice during this time.

100% Symptom Free after following Return to Play Protocol: Back to full play and games.

DURING THIS TIME, IF ANY OF THE SIGNS OR SYMPTOMS OF A CONCUSSION RETURN, PLAYERS ARE TO REFRAIN FROM ALL PHYSICAL ACTIVITY FOR 24 HOURS WHILE BEING SYMPTOM FREE FOR 24 HOURS, THEY MUST ALSO GO BACK "TWO DAYS" IN THE RETURN TO PLAY PROTOCOL.

Concussion Management Contact Information

Minnesota Safety Committee

Hal Tearse - Chairman
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Protocol Author

Jacob Mars
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YOU WOULD RATHER MISS ONE GAME THEN THE ENTIRE SEASON!



SIGNS AND SYMPTOMS

These signs and symptoms may indicate that a concussion has occurred.

| SIGNS OBSERVED BY COACHING STAFF | SYMPTOMS REPORTED BY ATHLETE |
|--|--|
| Appears dazed or stunned | Headache or "pressure" in head |
| Is confused about assignment or position | Nausea or vomiting |
| Forgets sports plays | Balance problems or dizziness |
| Is unsure of game, score, or opponent | Double or blurry vision |
| Moves clumsily | Sensitivity to light |
| Answers questions slowly | Sensitivity to noise |
| Loses consciousness (even briefly) | Feeling sluggish, hazy, foggy, or groggy |
| Shows behavior or personality changes | Concentration or memory problems |
| Can't recall events prior to hit or fall | Confusion |
| Can't recall events after hit or fall | Does not "feel right" |

ACTION PLAN

If you suspect that a player has a concussion, you should take the following steps:

1. Remove athlete from play.
2. Ensure athlete is evaluated by an appropriate health care professional. Do not try to judge the seriousness of the injury yourself.
3. Inform athlete's parents or guardians about the known or possible concussion and give them the fact sheet on concussion.
4. Allow athlete to return to play **only** with permission from an appropriate health care professional.

IMPORTANT PHONE NUMBERS

FILL IN THE NAME AND NUMBER OF YOUR LOCAL HOSPITAL(S) BELOW:

Hospital Name: _____

Hospital Phone: _____

Hospital Name: _____

Hospital Phone: _____

For immediate attention, CALL 911

If you think your athlete has sustained a concussion... take him/her out of play, and seek the advice of a health care professional experienced in evaluating for concussion.

For more information and to order additional materials **free-of-charge**, visit:
www.cdc.gov/ConcussionInYouthSports

July 2007

Concussion Report Minnesota Hockey

The following Concussion Report is to be completed and concussion protocol followed in order to allow proper diagnosis and return to play for players. Any forms not completed properly will result in players not being able to return to play in a timely manner. *If coaches are unsure whether a player suffered a concussion or not, this report must still be completed for documentation purposes.*

| | |
|---|-------------------------------|
| _____ <i>Player Name (Full name)</i> | _____ <i>Date of Birth</i> |
| _____ <i>Current Team</i> | _____ <i>Head Coach</i> |
| _____ <i>Parent(s) Name</i> | _____ <i>Home Phone</i> |
| _____ <i>E-mail Address</i> | |

COACHES REPORT

If possible concussion was not suffered at a team event, have parents complete section below to the best of their ability.

| | | | |
|-------------------------------------|-----------------------------------|-------------------------------------|--|
| _____ <i>Date of Head Injury</i> | _____ <i>Location of Event</i> | _____ <i>Apx. Time of Injury</i> | _____ <i>Game / Practice / Other Event Type</i> |
|-------------------------------------|-----------------------------------|-------------------------------------|--|

Describe situation:

Signs Observed by Coaching Staff (check all that apply)

| | |
|---|---|
| <input type="checkbox"/> Appears Dazed or Stunned | <input type="checkbox"/> Is confused about assignment or position |
| <input type="checkbox"/> Forgets sports plays | <input type="checkbox"/> Is unsure of game, score, or opponent |
| <input type="checkbox"/> Moves clumsily | <input type="checkbox"/> Answers questions slowly |
| <input type="checkbox"/> Loses consciousness | <input type="checkbox"/> Shows behavior or personality changes |
| <input type="checkbox"/> Can't recall events prior to head injury | <input type="checkbox"/> Can't recall events after hit or fall |
| <input type="checkbox"/> Other: _____ | <input type="checkbox"/> Other: _____ |

Symptoms Reported by Athlete (check all that apply)

| | |
|---|---|
| <input type="checkbox"/> Headache or "pressure" in head | <input type="checkbox"/> Nausea or vomiting |
| <input type="checkbox"/> Balance problems or dizziness | <input type="checkbox"/> Double or blurry vision |
| <input type="checkbox"/> Sensitivity to light | <input type="checkbox"/> Sensitivity to noise |
| <input type="checkbox"/> Feeling sluggish, hazy, foggy, or groggy | <input type="checkbox"/> Concentration or memory problems |
| <input type="checkbox"/> Confusion | <input type="checkbox"/> Does not "feel right" |
| <input type="checkbox"/> Other: _____ | <input type="checkbox"/> Other: _____ |

Coaches response to injury (be descriptive):

Athlete is not allowed to return to play until they have properly completed the association protocols and have been approved by the Concussion Manager for return to play. The player must go see a physician.

| | |
|-----------------------------------|----------------------|
| _____ <i>Coaches Signature</i> | _____ <i>Date</i> |
|-----------------------------------|----------------------|

PHYSICIANS REPORT
Initial Examination – Concussion Determination

Player Name (Full name)

Date of Birth

Physician Name and Office

Phone Number

Does the patient show signs of any of the following symptoms?:

| | | | |
|--------------------------|--|--------------------------|----------------------------------|
| <input type="checkbox"/> | Headaches or "pressure" in head | <input type="checkbox"/> | Nausea or vomiting |
| <input type="checkbox"/> | Balance problems or dizziness | <input type="checkbox"/> | Double or blurry vision |
| <input type="checkbox"/> | Sensitivity to light | <input type="checkbox"/> | Sensitivity to noise |
| <input type="checkbox"/> | Feeling sluggish, hazy, foggy, or groggy | <input type="checkbox"/> | Concentration or memory problems |
| <input type="checkbox"/> | Confusion | <input type="checkbox"/> | Does not "feel right" |
| <input type="checkbox"/> | Change in sleeping habits | <input type="checkbox"/> | Change in eating habits |
| <input type="checkbox"/> | Decrease in energy level | <input type="checkbox"/> | More emotional than normal |

Please complete the following types examinations and leave detailed notes.

Neurological Examination:

Mental Status Examination:

Cognitive Function Examination:

Gait and Balance Testing:

Was a CT or MRI scan performed? ___ Yes ___ No

If yes, what were the results of the scan?

Is the player complaining, mentioning, or showing signs of any other unusual behaviors? If yes, please explain.

Did the player take the ImPact test? ___ Yes ___ No

(If yes, please attach a copy of the test results and a brief description of results)

In your medical opinion, did the player suffer a concussion? ___ Yes ___ No

(If no, please attach a return to play note to this document)

If yes, was the concussion mild, moderate, or severe? ___ Mild ___ Moderate ___ Severe

Physician Signature

Date

I understand that if this player suffered a concussion, they must follow association protocol:

PHYSICIANS REPORT
Symptom Checkup

Player Name (Full name)

Date of Birth

Physician Name and Office

Phone Number

Does the patient show signs of any of the following symptoms?:

| | | | |
|--------------------------|---|--------------------------|----------------------------------|
| <input type="checkbox"/> | Headaches or "pressure" in head | <input type="checkbox"/> | Nausea or vomiting |
| <input type="checkbox"/> | Balance problems or dizziness | <input type="checkbox"/> | Double or blurry vision |
| <input type="checkbox"/> | Sensitivity to light | <input type="checkbox"/> | Sensitivity to noise |
| <input type="checkbox"/> | Feeling sluggish, hazy, foggy, or groggy | <input type="checkbox"/> | Concentration or memory problems |
| <input type="checkbox"/> | Confusion | <input type="checkbox"/> | Does not "feel right" |
| <input type="checkbox"/> | Change in sleeping habits | <input type="checkbox"/> | Change in eating habits |
| <input type="checkbox"/> | Decrease in energy level (not back to normal) | <input type="checkbox"/> | More emotional than normal |

Please complete the following types examinations and leave detailed notes, and compare to the results from the player's previous concussion checkup.

Neurological Examination:

Mental Status Examination:

Cognitive Function Examination:

Gait and Balance Testing:

Was a CT or MRI scan performed? ___ Yes ___ No
If yes, what were the results of the scan?

Is the player complaining, mentioning, or showing signs of any other unusual behaviors? If yes, please explain.

Is the player still showing any signs of having a concussion? ___ Yes ___ No

Is the player 100% symptom free? ___ Yes ___ No

If yes, do you believe the player can begin the Return to Play regiment? ___ Yes ___ No

If there are any other notes or comments relating to this checkup you feel would be important for the association to be aware of, please leave on back of page.

Physician Signature

Date

PHYSICIANS REPORT
Return to Play Permission

Player Name (Full name)

Date of Birth

Physician Name and Office

Phone Number

Please check the appropriate box as it related to the player.

- The above named player is 100% symptom free after suffering a concussion. This player is allowed to return to play and has completed the association Return to Play protocol.

If the player completed the ImPact test, those results are attached and are within the margin of error of their baseline results to suggest that they are symptom free.

In my medical opinion, the above named player is ready to return to full contact play.

- The above named player is not ready to return to play and will need to continue the Return to Play protocol starting back at day # _____. The player is still showing the following signs and symptoms of a concussion:

If the player completed the ImPact test, those results are / are not (circle one) within the margin of error to their baseline to suggest the player is / is not (circle one) symptom free.

- The above named player will need much more medical attention before being ready to return to play. I will continue to evaluate the player until that time.

Physician Signature

Date

Parent Signature

Date

Head Coach Signature

Date

Pocket SCAT2



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.

1. Symptoms

Presence of any of the following signs & symptoms may suggest a concussion.

- Loss of consciousness
- Seizure or convulsion
- Amnesia
- Headache
- "Pressure in head"
- Neck Pain
- Nausea or vomiting
- Dizziness
- Blurred vision
- Balance problems
- Sensitivity to light
- Sensitivity to noise
- Feeling slowed down
- Feeling like "in a fog"
- "Don't feel right"
- Difficulty concentrating
- Difficulty remembering
- Fatigue or low energy
- Confusion
- Drowsiness
- More emotional
- Irritability
- Sadness
- Nervous or anxious

2. Memory function

Failure to answer all questions correctly may suggest a concussion.

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

3. Balance testing

Instructions for tandem stance

"Now stand heel-to-toe with your non-dominant foot in back. Your weight should be evenly distributed across both feet. 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."

Observe the athlete for 20 seconds. If they make more than 5 errors (such as lift their hands off their hips; open their eyes; lift their forefoot or heel; step, stumble, or fall; or remain out of the start position for more than 5 seconds) then this may suggest a concussion.

Any athlete with a suspected concussion should be IMMEDIATELY REMOVED FROM PLAY, urgently assessed medically, should not be left alone and should not drive a motor vehicle.

SCAT2



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?¹

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 |
| Obeys 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? | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 |
| Which half is it now? | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 |
| Who scored last in this match? | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 |
| What team did you play last week/game? | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 |
| Did your team win the last game? | <input type="checkbox"/> 0 | <input type="checkbox"/> 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? | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 |
| What is the date today? | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 |
| What is the day of the week? | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 |
| What year is it? | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 |
| What time is it right now? (within 1 hour) | <input type="checkbox"/> 0 | <input type="checkbox"/> 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="checkbox"/> 0 | <input type="checkbox"/> 1 | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | candle | baby | finger |
| apple | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | paper | monkey | penny |
| carpet | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | sugar | perfume | blanket |
| saddle | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | sandwich | sunset | lemon |
| bubble | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | wagon | iron | insect |
| Total | | | | | | | |

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="checkbox"/> 0 | <input type="checkbox"/> 1 | 6-2-9 | 5-2-6 | 4-1-5 |
| 3-8-1-4 | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | 3-2-7-9 | 1-7-9-5 | 4-9-6-8 |
| 6-2-9-7-1 | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | 1-5-2-8-6 | 3-8-5-2-7 | 6-1-8-4-3 |
| 7-1-8-4-6-2 | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | 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

Balance examination

This balance testing is based on a modified version of the Balance Error Scoring System (BESS)[®]. 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 |

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

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

Clinic phone number

Patient's name

Date/time of injury

Date/time of medical review

Treating physician

Contact details or stamp