Irish Hockey is aware that there can be serious sequelae for players suffering from concussion. This is not limited to the immediate consequences of acute head injury. The long term effects of head injury and concussion are well recognised and can be minimised with appropriate immediate and longer term care.

Most of the hockey played in Ireland, indeed throughout the world, takes place without formal pitch side medical or first aid cover and it is hoped that these guidelines will help both players and those in charge of players.

**Guidelines Summary**

➢ Concussion is a brain injury that needs to be taken seriously to protect the long term welfare of all players.
➢ Any player suspected of having sustained a concussion, should be safely removed immediately from the field and should not return to play or train on the same day. If there is any doubt as to whether a player has suffered concussion apply the guidelines.
➢ Where a Team Doctor is present, they must advise the person in charge of the team (i.e. Team Manager/Coach) in this regard and the player must not be allowed to continue their participation in the game.
➢ Concussion is an evolving injury. It is important to monitor the player after the injury for progressive deterioration.
➢ They should be advised to seek medical help, especially if they have continuing problems.
➢ Concussion diagnosis is a clinical judgement – Use of the SCAT 3 can only aid the doctor in their diagnosis.
➢ Players suspected of having a concussion must have adequate rest of at least 24 hours and then must follow a graduated return to play protocol.
➢ Players must receive medical clearance (by a doctor) before returning to play.
➢ Younger athletes require a more conservative approach to protect the developing brain.

**What is Concussion?**

Concussion is a brain injury and can be caused by a direct or indirect hit to the player’s head or body. Concussion typically results in an immediate onset of short lived signs and symptoms. However in some cases, the signs and symptoms of concussion may evolve over a number of minutes or hours. Loss of consciousness occurs in less than 15% of concussion cases and whilst a feature of concussion, loss of consciousness is not a requirement for diagnosing concussion.
Concussion is only one diagnosis that may result from a head injury. Head injuries may result in one or more of the following:

1. Superficial injuries to scalp or face such as lacerations and abrasions
2. Subconcussive event – a head impact event that does not cause a concussion
3. Concussion - an injury resulting in a disturbance of brain function
4. Structural brain injury - an injury resulting in damage to a brain structure for example fractured skull or a bleed into or around the brain.

Structural brain injuries may present mimicking a concussion. In this instance the signs and symptoms of a structural brain injury will usually persist or deteriorate over time e.g. persistent or worsening headache, increased drowsiness, persistent vomiting, increasing confusion and seizures.

Medical assessment of a concussion or a head injury where the diagnosis is not apparent is recommended to exclude a potential structural brain injury. In concussion typically standard neuro-imaging such as MRI or CT scan is normal.

All head injuries should be considered associated with cervical spine injury until proven otherwise. If there is any concern that there is a cervical spine injury the player should not be moved and urgent medical/ambulance help called. (See Appendix 2)

Different ages
It is widely accepted that children and adolescent athletes (18 years and under) with concussion should be managed more conservatively. This is supported by evidence that confirms that children:

1. are more susceptible to concussion
2. take longer to recover
3. have more significant memory and mental processing issues.
4. are more susceptible to rare and dangerous neurological complications, including death caused by a second impact syndrome.

CONCUSSION MUST BE TAKEN EXTREMELY SERIOUSLY

Signs and Symptoms
Contrary to popular belief, most concussion injuries occur without a loss of consciousness and so it is important to recognise the other signs and symptoms of concussion. Concussion must be recognised as an evolving injury in the acute stage. Some symptoms develop immediately while other
symptoms may appear gradually over time (24 hours +). Monitoring of players after the injury is therefore an important aspect of concussion management.

Diagnosis of acute concussion should involve the following:
1. Player’s subjective report of their symptoms.
2. Observation of the player for physical signs of concussion.
3. Assessment of the player for cognitive change or decline.
4. Observation of players for behavioural change.
5. Players report of any sleep disturbance.

Table 1: Concussion Assessment Domains

<table>
<thead>
<tr>
<th>Indicators</th>
<th>What you Would Expect to See</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms</td>
<td>Headaches*</td>
</tr>
<tr>
<td></td>
<td>Dizziness</td>
</tr>
<tr>
<td></td>
<td>‘Feeling in a fog.’</td>
</tr>
<tr>
<td>Physical Signs</td>
<td>Loss of consciousness</td>
</tr>
<tr>
<td></td>
<td>Vomiting</td>
</tr>
<tr>
<td></td>
<td>Vacant Facial Expression</td>
</tr>
<tr>
<td></td>
<td>Clutching Head</td>
</tr>
<tr>
<td></td>
<td>Motor Inco-ordination (unsteady on feet, falling, poor balance)</td>
</tr>
<tr>
<td>Cognitive Impairment</td>
<td>Loss short term memory</td>
</tr>
<tr>
<td></td>
<td>Difficulty with concentration</td>
</tr>
<tr>
<td></td>
<td>Decreased attention</td>
</tr>
<tr>
<td></td>
<td>Diminished work performance</td>
</tr>
<tr>
<td>Behavioural Changes</td>
<td>Irritability</td>
</tr>
<tr>
<td></td>
<td>Anger</td>
</tr>
<tr>
<td></td>
<td>Mood Swings</td>
</tr>
<tr>
<td></td>
<td>Feeling Nervous</td>
</tr>
<tr>
<td></td>
<td>Anxious</td>
</tr>
<tr>
<td>Sleep Disturbance</td>
<td>Drowsiness</td>
</tr>
<tr>
<td></td>
<td>Difficulty Falling Asleep</td>
</tr>
</tbody>
</table>

* most common symptom

Pitch Assessment of a Concussion Injury

- The player should be assessed by a doctor or registered healthcare practitioner (Physiotherapist/ Nurse) on the field using standard emergency management principles. Particular attention should be given to excluding a cervical spine injury.
If no healthcare practitioner is available the player should be safely removed from practice or play and urgent referral to a doctor is required.

Once the first aid issues are addressed, an assessment of the concussive injury should include clinical judgement and the use of the SCAT 3 (medical or trained personnel only)

The player should NOT be left alone following the injury and regular observation for deterioration is essential over the initial few hours following injury. They should not drive a car or consume alcohol.

Note:
*Need to recognise that the appearance of symptoms might be delayed several hours following a concussive episode. Example: there may be no forgetfulness (retrograde amnesia) present at 0 minutes post injury, yet forgetfulness (amnesia) may be present at 10 minutes post injury.
*Orientation tests (i.e. name, place, and person) have been shown to be an unreliable cognitive function test in the sporting situation.

Return to Play

• A player with a diagnosed concussion should NEVER be allowed to return to play on the day of injury.

• Return to play must follow a medically supervised stepwise approach and a player MUST NEVER return to play while symptomatic

The most important aspect of concussion management is physical and cognitive rest until the acute symptoms resolve and then a graded program of exertion prior to medical clearance and graduated return to play (GRTP) completed. (See Table 2 below)

1. There should be an initial period of 24-48 hours physical and mental rest for any player after a concussive injury.
2. GRTP protocols following concussion follow a stepwise approach. With this stepwise progression, the players should continue to proceed to the next level only if asymptomatic at the current level.
3. Generally each step should take 24 hours so that the athlete would take approximately one week to proceed to full rehabilitation once they are asymptomatic at rest.
4. If any post concussion symptoms occur while in the GRTP program, then the player should drop back to the previous asymptomatic level and try to progress again after a further 24 hours period of rest has passed. They should be honest to protect themselves.

Medical clearance (medical clearance refers to medical doctors) is required prior to return to full contact sports.

Table 2 Graduated Return to Play Protocol
Helping your players cope with their concussion injury.

The best medical management for concussion is rest (Cognitive and Physical).
Players often feel tired and may experience difficulties at work or school when carrying at task which require concentration. Players may also encounter mood difficulties and feel depressed, anxious or irritable with family or team mates. Support should be provided to players during this recovery period. Alcohol should be avoided as it may delay recovery and put the player at increased risk for further injury.
When dealing with persistent symptoms, it is essential that players only take medications prescribed by their doctor.
Recovery form concussion should not be rushed nor pressure applied to players to resume playing until recovery is complete. The risk of re injury is high and may lead to recurrent concussion injuries which can cause long term damage.
Remember “better to have missed one game than the whole season, or worse.”

Concussion Management in Children 5 years – 18 years

<table>
<thead>
<tr>
<th>Rehabilitation Stage</th>
<th>Exercise Allowed</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Rest as per minimum rest period prescribed for player's age</td>
<td>Complete physical and cognitive rest without symptoms</td>
<td>Recovery</td>
</tr>
<tr>
<td>2. Light aerobic exercise Walking, swimming or stationary cycling keeping intensity, &lt;70% maximum predicted heart rate. No resistance training.</td>
<td>Symptom free during full 24-hour period</td>
<td>Increase heart rate</td>
</tr>
<tr>
<td>3. Sport-specific exercise</td>
<td>Running drills. No head impact activities</td>
<td>Add movement</td>
</tr>
<tr>
<td>4. Non-contact training drills</td>
<td>Progression to more complex training drills, e.g. passing drills. May start progressive resistance training</td>
<td>Exercise, coordination, and cognitive load</td>
</tr>
<tr>
<td>6. Return to play</td>
<td>Player rehabilitated</td>
<td>Recover</td>
</tr>
</tbody>
</table>
Concussion management is different due to the following factors:
Brain development, variable growth rates, language difficulties, child versus parental reports of symptoms, lack of medical coverage at underage games, physical examination in children is usually normal.

Management in Children:
Rest for minimum time recommended below.
- No sports, exertions, minimal TV, PC Use, Music etc
- Occasionally there is a need for gradual return to school work, increase breaks during school day etc (on medical recommendation)

A summary of the minimum rest periods and different length GRTP stages for different ages is shown below:

**Players 15 years and under**
- Minimum rest period 2 weeks and symptom free
- GRTP to follow rest, with each stage lasting 48 hours
- Earliest return to play - Day 23 post injury

**U/16 - U/19 - Players 16, 17 and 18 years of age**
- Minimum rest period 1 week and symptom free
- GRTP to follow rest, with each stage lasting 24 hours
- Earliest return to play - Day 12 post injury

**Adult - 19 years and over**
- Minimum rest period 24 hours and free of symptoms
- GRTP to follow rest, with each stage lasting 24 hours
- Earliest return to play - Day 6 post injury

A GRTP should only commence if the player:
- has completed the minimum rest period for their age
- is symptom free and off medication that modifies symptoms of concussion.

Medical or approved healthcare professional clearance is required prior to commencing a GRTP.

**Recurrent or difficult concussions**

Following a concussion a player is at an increased risk of a second concussion within the next 12 months. Irish Hockey recommends that all concussions be taken seriously and that full recovery be achieved prior to re-introduction of exercise.

Players with:
- a second concussion within 12 month
• a history of multiple concussions
• unusual presentations or
• prolonged recovery

should be assessed and managed by health care providers (multi-disciplinary) with experience in sports-related concussions.

If a medical practitioner experienced in concussion management or approved healthcare provider is unavailable the player with a recurrent or difficult concussion history should be managed using the GRTP protocol from the lower age group as a minimum.

Sports Concussion Assessment Tool 3 (SCAT3, Appendix 1)

While the diagnosis of concussion is a clinical judgment ideally made by a medical professional, the SCAT 3 provides a standardized tool assessing an injured player aged from 13 years and older for concussion. SCAT 3 is designed for use by registered medical practitioners and other clinical personnel that have appropriate training to use SCAT 3. SCAT 3 consists of two parts - the first part is an initial pitch side assessment of injury severity (Concussion signs, Glasgow Coma Scale and Maddocks Score). Any player with a suspected concussion should be REMOVED FROM PLAY, medically assessed, monitored for deterioration and should not drive a motor vehicle until cleared to do so by a registered medical practitioner. The second part of the SCAT 3 should be carried out after a minimum 15 minute rest period to avoid the influence of exertion and fatigue on the player’s performance. This assessment consists of symptom checklist, symptom severity, as well as neuro cognitive and balance functions. It is recognised that 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. The diagnosis of a concussion is a clinical judgement in the end.

Conclusion

Irish Hockey recommends that the “Gold Standard” concussion management be implemented for all players diagnosed with a concussion or when a player is suspected of having a concussion during a game or training at which there is no approved health care professional present.

This “Gold Standard” includes:

• Assessment by a certified medical practitioner familiar with international concussion protocols;
• Thorough, serial symptom analysis;
• General and neurological examination;
• Balance assessment; and
• Assessment of cognitive function preferably compared to a pre-injury baseline.

Concussion management - 6 “Rs”

**Recognise** – Learn the signs and symptoms of a concussion so you understand when an athlete might have a potential concussion.

**Remove** – If an athlete has a concussion or even a potential concussion he or she must be safely removed from play immediately.

**Refer** – Once removed from play, the player should be referred immediately to a medical practitioner or qualified healthcare professional who is trained in evaluating and treating concussions.

**Rest** – Players must rest from exercise until symptom-free and then start a Graduated Return to Play program.

Irish Hockey recommends minimum rest periods for different ages –

U/6 to U/15 – 2 weeks minimum rest

U/16-U/19 - 1-week minimum rest

Adults - 24 hours minimum rest

**Recover** – Full recovery from the concussion is required before return to play is authorized. This includes being symptom-free. Rest and specific treatment options are critical for the health of the injured participant.

**Return** – In order for safe return to play in Hockey, the athlete must be symptom-free and cleared in writing by a medical practitioner or approved healthcare professional who is trained in evaluating and treating concussions.

The athlete must complete a GRTP (Graduated Return to Play) program.

Irish Hockey acknowledges the permission from Dr Mike Rossiter, GB & England Hockey, for permission to quote from his document, Concussion Policy, and from GAA to quote from their Concussion Management Guidelines.

Appendix 1 & 2 are included for information. The Pocket Concussion Recognition Tool – For Use By All persons involved in Sport is recommended as an aide memoir for all involved in supervision of players. [Appendix 2].
Appendix 1: SCAT 3 - Medical Professional Use Only
What is the SCAT3?¹

The SCAT3 is a standardized tool for evaluating injured athletes for concussion and can be used in athletes aged from 10 years and older. It supersedes the original SCAT and the SCAT2 published in 2005 and 2009, respectively. For younger persons, ages 12 and under, please use the Child SCAT. The SCAT3 is designed for use by medical professionals. If you are not qualified, please use the Sports Concussion Recognition Tool. Performance 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 reproduction in a digital form requires approval by the Concussion in Sport Group.

NOTA: The diagnosis of 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 judgment. 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. The Concussion should be suspected in the presence of any one or more of the following:

- Symptoms (e.g., headache);
- Physical signs (e.g., unsteadiness);
- Impaired/abnormal function (e.g., confusion);
- Abnormal behavior (e.g., change in personality).

SIDELINE ASSESSMENT

Indications for Emergency Management

NOTA: All to the head/neck injuries are 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 ≤ 8;
- Deteriorating mental status;
- Potential spinal injury;
- Progressing 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/neck, 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;
- "If so, how long?"; Balance or motor incoordination (stumbling, falling, bowels/micturition, etc.);
- Disorientation/confusion (difficulty named appropriately to person);
- Loss of memory;
- "If so, how long?";
- "Before or after the injury?";
- Blank or vacant look;
- Visible facial injury in combination with any of the above.

Glasgow Coma scale (GCS)

<table>
<thead>
<tr>
<th>Best eye response (E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No eye opening</td>
</tr>
<tr>
<td>Eye opening in response to pain</td>
</tr>
<tr>
<td>Eye opening to speech</td>
</tr>
<tr>
<td>Eye opening spontaneously</td>
</tr>
</tbody>
</table>

Best verbal response (V)

<table>
<thead>
<tr>
<th>Verbal response</th>
</tr>
</thead>
<tbody>
<tr>
<td>No verbal response</td>
</tr>
<tr>
<td>Incoherent words</td>
</tr>
<tr>
<td>Confused</td>
</tr>
<tr>
<td>Oriented</td>
</tr>
</tbody>
</table>

Glasgow Coma score (E + V + M)

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

Maddocks Score²

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

Maddocks indicates 0 points for each (correct) answer.

What time are we at today? [ ] [ ]
Which hand is it now? [ ] [ ]
Who scored last in this match? [ ] [ ]
What team did you play last week? [ ] [ ]
Did your team win the last game? [ ] [ ]

Maddocks score [ ] [ ]

Notes: Mechanism of injury [ ] [ ] [ ]

Any athlete with a suspected concussion should be removed from play, medically assessed, monitored for deterioration (e.g., 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.

SCAT3 SPORT CONCUSSION ASSESSMENT TOOL 3 PAGE 1  © 2013 Concussion in Sport Group
BACKGROUND

Name: ____________________________ Date: ____________________________
Examiner: ________________________
Sport/Team/School: ____________________________ Date/time of injury: ____________________________
Age: __________ Gender: _____ Male _____ Female _____
Years of education completed: _____ 1st-3rd grade _____ 4th-6th grade _____ 7th-12th grade _____ GED _____
Dominant hand: _____ Right _____ Left _____ Neither _____
How many concussions do you think you have had in the past? _____ 1st-3rd _____ 4th-6th _____ 7th-12th _____ GED _____
When was the first recorded concussion? _____ 1st-3rd grade _____ 4th-6th grade _____ 7th-12th grade _____ GED _____
How long was your recovery from the first recorded concussion? _____ 1st-3rd grade _____ 4th-6th grade _____ 7th-12th grade _____ GED _____
Have you ever been hospitalized or had fluid being removed from a head injury? _____ Yes _____ No _____
Have you ever been diagnosed with a concussion or brain injury? _____ Yes _____ No _____
Do you have a learning disability, dyslexia, ADHD/ADD? _____ Yes _____ No _____
Have you ever been diagnosed with depression, anxiety, or other psychiatric disorders? _____ Yes _____ No _____
Has anyone in your family ever been diagnosed with any of these problems? _____ Yes _____ No _____
Are you on any medications? If yes, please list: ____________________________

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

SYMPTOM EVALUATION

How do you feel?

*You should score yourself on the following symptoms (based on how you feel now):*

- 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 'on a foggy day'
- Don’t feel right
- Difficulty concentrating
- Difficulty remembering
- Fatigue or low energy
- Confusion
- Drowsiness
- Trouble falling asleep
- More emotional
- Irritability
- Soreness
- Nerves or Numbness

Total number of symptoms (Max 1-12): _____ _____
Symptom severity score (out of 3): _____ _____

Do the symptoms get worse with physical activity? _____ Yes _____ No
Do the symptoms get worse with mental activity? _____ Yes _____ No

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:
- No different
- Very different
- Unsure
- N/A

Cognitive & Physical Evaluation

4

Cognitive assessment

Standardized Assessment of Concussion (SAC)®

- Orientation
  - Present date
  - What is the date today?
  - What is the day of the week?
  - What year is it?
  - What time is it now (circle hour)?

Orientation score: _____

Immediate memory

- Digits Recall: _____ 0-2 _____ 3-4 _____ 5-6 _____ 7-8 _____ 9-10
- Days: _____ Week: _____ Month: _____ Year: _____
- CVC word: _____ Word: _____ Figure copy:

Immediate memory score: _____

Concentration

- Stroop Test: _____ 0-4-8-12-16-20-24-28-32-36-40-44-48-52-56-60-64-68-72-76-80-84-88-92-96-100
- Digit Span: _____ Baseline: _____

Total concentration score: _____

Neck Examination:

Range of motion: Upper and lower limb sensation, strength

Findings:

Balance examination

- Stork test
- Romberg test
- Modified Balance Error Scoring System (BESS) testing:

Condition:
- Double leg stance:
- Single leg stance (bilateral): _____ _____
- Single leg stance (dominant leg): _____ _____

And/Or:
- Tandem gait:

Coordination examination

Upper limb coordination

Findings:

SAC Delayed Recall®

Delayed recall score: _____

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INSTRUCTIONS

Words in italics throughout the SCA33 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 the SCA33, maximum possible is 23.

For Symptom severity scores, add all scores together; maximum possible is 23 x 1 = 23.

SAQ-4

Immediate Memory

"I am going to test your memory. I will lead 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 them before."

Complete 3 trials required at a score of at least 16.0. Fail the test at any rate of score per second.

Score 1 pt. for each correct response. Total score equals three across all 3 trials. Don’t concern the athlete that 10-packet points will be scored.

Concentration

Digits backward

"I am going to read a string of numbers and when I am done, repeat them back to me backward, in reverse order of how I read them to you. For example, if I say 7, 4, 1, you would say 1, 4, 7."

If correct, go to next question. If incorrect, total trail 2. One point possible for each string length. Stop after second on third trial. The digits should 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. December, November, ... (do aloud)."

1 pt. for entire sequence correct.

Delayed Recall

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

"Do you remember that list of words read to you 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

"You are now going to test your balance. Please take your shoes off, roll up your pant legs above your ankles, and place your hands on your hips."

This test will consist of three twenty-second tests with different tasks.

(a) Double leg stance:

"The first task 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 lose your balance."

(b) Single leg stance:

"If you fall in both the forward and backward directions, you will be given a different task to maintain stability for 20 seconds with your hands on your hips and your eyes closed. You will be counting the number of times you lose your balance."

(c) Tandem Stance:

"Now stand feet-to-toe with your non-dominant foot in back. Your weight should be evenly distributed on both feet. Again, you should try to maintain stability for 20 seconds with your hands on your hips and your eyes closed. You will be counting the number of times you lose your balance."

Balance testing - types of errors

1. Hands fell off either side.
2. Opening eyes.
3. Drop, stumble, or fall.
4. Moving hips into > 30 degree abduction
5. Lifting toe/foot 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 examinee 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 condition contains multiple errors simultaneously, only one error is recorded but the athlete should quickly return to the starting 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 sec.worth).

Tandem Stance

Participants are instructed to stand with their feet together (both feet), facing forward, and keep their feet together at all times. The examiner will then count the number of steps the athlete can take while maintaining balance on one leg for 10 seconds. If the athlete falls or loses balance, they must return to the starting position. The number of correct steps taken is recorded. The full score is 10 points, and the athlete is penalized for any falls or imbalances.

Coordination Examination

Upper limb coordination

"I am going to test your coordination now. Please sit comfortably on the chair with your eyes open and your arm outstretched and hold the string as steadily as possible."

The upper limb coordination test is performed for the left and right hand separately, with the examiner counting the number of times the athlete holds the string correctly for 10 seconds. The athlete must continuously hold the string horizontally before starting, then return to the starting position, and do so accurately as possible.

Sitting: Correct repetitions in 10 seconds = 10

Note for reference: The full score is 10 if the athlete's score differs across the two sides, indicating that they are able to perform equally on both sides.

References & Footnotes

1. This test 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 consensus outcomes and the authors of the tool are published in the Br J Sports Med Prevent Health Protoc, 2013, Volume 41(1), Issue 6. The outcome paper will also be simultaneously be published in other leading biomedical journals with the copyright held by the Concussion in Sport Group. To allow unrestricted distribution, peer review and alternative assessments are made possible.


ATHLETE INFORMATION

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

Signs to watch for
Problems can arise over the first 24–48 hours. The athlete should not be left alone and must go to a hospital at once if they:
- Have a headache that gets worse
- Are very drowsy or can’t be awakened
- Can’t recognize people or places
- Have repeated vomiting
- Behave unusually or seem confused; are very irritable
- Have seizures (arms and legs jerk uncontrollably)
- Have weak or numb arms or legs
- Are unsteady on their feet, have slurred speech

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

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

<table>
<thead>
<tr>
<th>Stage</th>
<th>Objective of each stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Most acute</td>
<td>Physical and cognitive rest</td>
</tr>
<tr>
<td>2: Light activity</td>
<td>Walking, cycling, or light swimming/biking/treadmil, no contact</td>
</tr>
<tr>
<td>3: Contact activity</td>
<td>Full contact activities, may perform in sleds or with protective padding to simulate a contact situation</td>
</tr>
<tr>
<td>4: Return to play</td>
<td>Full contact activities, may include live play</td>
</tr>
</tbody>
</table>

There should be at least 24 hour(s) between each stage. If symptoms recur the athlete should rest until they resolve once again and then resume the program at the previous asymptomatic stage. Resistance training should only be added in the later stages.

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

Medical clearance should be given before return to play.

CONCUSSION INJURY ADVICE

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

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

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

Other important points:
- Rest (physically and mentally), including training or playing sports until symptoms resolve and you are medically cleared
- No alcohol
- No prescription or non-prescription drugs without medical supervision
  - Specifically:
    - No sedating tablets
    - Do not use aspirin, anti-inflammatory medication or301
  - Do not drive until medically cleared
  - Do not return to play sport until medically cleared

Clinic phone number

Patient’s name
Date/time of injury
Date/time of medical review
Treat physician
Appendix 2: Pocket Concussion Recognition Tool – For Use By All persons involved in Sport