

Concussion Policy

Guideline summary

- **RECOGNISE AND REMOVE** - learn to recognise the signs and symptoms of concussion and remove a player from the field if ANY doubt.
- **PROTECT OUR YOUNG ATHLETES** – England & GB Hockey recommends different return to play protocols for different ages.
- Concussion must be taken extremely seriously to safeguard the long-term welfare of players.
- **All players with a diagnosed concussion must be removed from the field of play and not return to play or train on the same day.** Players with a diagnosed concussion must go through a graduated return to play program (GRTP), described later in this document.
- All players with a suspected concussion where no appropriately trained personnel are present must be assumed to have a diagnosed concussion and must be removed from the field of play and not return to play or train on the same day. In this situation, players must go through a graduated return to play (GRTP) protocol.
- Players who complete a GRTP must receive medical clearance from a doctor or an approved healthcare professional before returning to play

GB & England Hockey takes player welfare seriously and has been a primary supporter of the 2008, 2012 and 2016 Concussion in Sport Consensus Meetings. These meetings bring together the world experts in concussion every four years to review the current evidence surrounding concussion.

Following a Consensus Conference, a position paper (Consensus Statement) is developed summarizing the current evidence based on knowledge in the area of concussion.

This 2016 Concussion Guideline has been updated to reflect the principles agreed following the 2012 Concussion Consensus conference. The 2016 Consensus has yet to be finalized and therefore further changes may follow once this has been published.

These guidelines are designed to be used by Medical Practitioners and approved healthcare professionals. All other parties involved in concussion management should refer to the guidelines for non-approved healthcare professionals and General Public.

These Guidelines are meant to ensure that players who suffer concussion are managed effectively to protect their short and long-term health and welfare. Scientific knowledge in the field of concussion is constantly evolving and the consensus process and scientific meetings will make sure that the guidelines keep pace with these changes.

What is Concussion?

Concussion is a mild traumatic brain injury caused by either direct or indirect forces to the head.

Concussion typically results in the rapid onset of short-lived impairment of brain function.

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 results in a disturbance of brain function (e.g. memory disturbance, balance problems or symptoms) rather than damage to structures such as blood vessels, brain tissue or fractured skull.

Typically standard neuro-imaging such as MRI or CT scan is normal.

CONCUSSION MUST BE TAKEN EXTREMELY SERIOUSLY.

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 eg 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.

All head injuries should be considered associated with cervical spine injury until proven otherwise.

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

Diagnosis and assessment of concussion

Identifying concussion

GB & England Hockey supports and promotes RECOGNISE and REMOVE.

The Pocket Concussion Recognition Tool developed by the Zurich 2012 Concussion Consensus Group supports this Recognise and Remove message and is suitable for use in Aged Grade and Community Hockey. This Tool highlights the signs and symptoms suggestive of a concussion.

They include:

Visible clues of potential concussion - what you see

Any one or more of the following visual clues can indicate a possible concussion:

- Dazed, blank or vacant look
- Lying motionless on ground / Slow to get up
- Unsteady on feet / Balance problems or falling over / Inco-ordination
- Loss of consciousness or responsiveness
- Confused / Not aware of plays or events
- Grabbing / Clutching of head
- Convulsion
- More emotional / Irritable

Symptoms of potential concussion - what you are told

Presence of any one or more of the following signs and symptoms may suggest a concussion:

- Headache
- Dizziness
- Mental clouding, confusion, or feeling slowed down
- Visual problems
- Nausea or vomiting
- Fatigue
- Drowsiness / Feeling like "in a fog" / difficulty concentrating
- "Pressure in head"
- Sensitivity to light or noise

Questions to ask - what questions to ask

Failure to answer any of these questions correctly may suggest a concussion:

- "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?"

If a player is has signs or symptoms of a possible concussion that player must be: **RECOGNISED AND REMOVED** and **IF IN DOUBT, SIT THEM OUT**.

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On field or pitch side management

A player with a signs or symptoms of concussion must be removed in a safe manner in accordance with emergency management procedures and medically assessed.

If a cervical spine (neck) injury is suspected, the player should only be removed by emergency healthcare professionals with appropriate spinal care training.

Team mates, coaches, match officials, team managers, administrators or parents who observe an injured player displaying any of the signs or symptoms after an injury event with the potential to cause a concussion **MUST** do their best to ensure that the player is removed from the field of play in a safe manner.

Pitch side management

Uncertainty regarding the timing of the sideline assessment exists and this is highlighted by the two conflicting recommendations within the Zurich 2012 papers.

The Consensus Statement identifies that "It is recommended that these latter steps be conducted following a 15 minute rest period on the sideline to avoid the influence of exertion or game fatigue on the athlete's performance. Although it is noted that this time frame is an ARBITRARY one, the expert panel agreed nevertheless that a period of rest was important prior to assessment."

The Putukian paper titled On Field Assessment states "Sideline concussion assessment tools should include a symptom checklist, balance assessment and cognitive assessment as an absolute minimum, with the assessment performed as soon as possible after the injury, with the understanding that the research related to the timing of the exam is not yet clear and that concussion signs and symptoms evolve over time".

Free interchange sports, such as Hockey, are not time restricted and are able to incorporate a rest period prior to post injury assessment.

The primary reason for sports adopting the 15-minute period assessment is to allow athletes time to rest prior to a concussion assessment. This rest period is recommended to allow athletes to recover from game induced fatigue and avoid false positive results occurring due to this fatigue.

Diagnosing concussion

The 2012 Concussion Consensus Statement, recognised as the best practice document for concussion management, identifies concussion as being among the most complex injuries in sports medicine to diagnose, assess and manage. This paper also confirms that there is no perfect diagnostic test or marker for the immediate diagnosis of concussion in the sporting environment

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The 2012 Statement also confirmed that clinical diagnosis by a doctor remains the gold standard and this diagnosis should be supported by:

- a review of symptoms using a standardised checklist
- cognitive (memory) assessment and
- balance evaluation

In summary the diagnosis of concussion is a clinical diagnosis supported by a multi-modal tool such as SCAT 3 (*Appendix 1*) SCAT 4 is currently under development and expected to be published 2017. Decisions regarding concussion should not be based solely on the results of any support tool and remain a clinical decision for doctors supported by tools such as SCAT 3.

SCAT 3 interpretation

The SCAT 2, developed following the 2008 Concussion Consensus Conference, used an overall score based on a maximum of 100 points. Results of the SCAT 2 used this post injury 'overall' score and compared it against the 'overall' baseline score of an injured individual to support a diagnosis of concussion.

SCAT 3 introduced following the 2012 Concussion Consensus Conference recommends that each mode, that is:

- symptom checklist
- cognitive assessment assessed using the SAC system to test memory
- balance evaluation be compared against the baseline for that mode as opposed to a total score comparison. Any variation in one or more mode(s) is strongly in favour of concussion.

If no baseline data is available, then the following should be considered strongly in favour of a diagnosis of concussion:

- Symptom checklist - one or more symptoms declared in the symptom list which is not usually experienced by the player following a match or training
- OR
- Balance evaluation - Tandem test - 3 or more errors or single leg stance test - 4 or more errors
- OR
- SAC assessment:
- Total SAC score 24 or below
 - Concentration score (digits backward) 2 or below
 - Delayed recall 3 or less words

Players with baseline assessments below the above scores should be scrutinized to confirm that the baseline testing has not been manipulated by the player.

GB & England Hockey recommends the utilization of SCAT 3 for all players 13 years and older if practical.

A child SCAT 3 (*Appendix 2*) is now available for players under 13 years of age.

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In summary, the diagnosis of concussion is a clinical diagnosis supported by a tool such as SCAT 3. Decisions regarding concussion should NOT be based solely on the results of any support tool and remain a clinical decision for doctors.

Neuropsychological (computerized) testing

Cognitive recovery largely overlaps with the time course of symptom recovery; however it more commonly follows symptom resolution. This delay in cognitive recovery supports the use of tools that assess cognition such as paper-based neuro-cognitive tests

Makdissi et al in 2010 confirmed this delay in cognitive recovery when they compared cognitive recovery to symptom resolution. Data from this study confirmed that impairments on computerised testing persisted for 2–3 days after symptom resolution in 35% of concussed athletes.

Despite Makdissi's study, sole reliance on neuropsychological (NP) testing to determine recovery and return to play is not recommended. Studies by both Echlin and Broglio confirmed that normal NP testing occurred in up to 38% of diagnosed concussive cases who had persistent symptoms.

In summary, sole reliance on computer NP testing to determine a return to play is NOT recommended. If available, NP testing can be used in conjunction with symptom checklists and balance evaluation as an aid to the clinical decision making process.

If computer NP testing is not available then paper-based tests can be used
(Appendix 3)

Onset of symptoms

It should be noted that the signs and symptoms of concussion can present at any time but typically become evident in the first 24-48 hours following a head injury.

Recovery from concussion

Recovery from concussion is spontaneous and typically follows a sequential course. The majority (80–90%) of concussions resolve in a short (7–10 day) period, although the recovery time frame may be longer in children and adolescents.

Players must be encouraged not to ignore symptoms at the time of injury and must not return to play prior to the full recovery following a diagnosed concussion. The risks associated with premature return to play include:

- a. a second concussion due to increased risk
- b. an increase risk of other injuries because of poor decision making or reduced reaction time associated with a concussion
- c. reduced performance
- d. serious injury or death due to an unidentified structural brain injury
- e. a potential increased risk of developing long-term neurological deterioration

Comprehensive medical assessment and follow up is required until a concussion has fully resolved. Players must be honest with themselves and medical staff for their own protection.

GB & England Hockey recognizes the heightened risk of head injury and concussion and its complications in children and adolescent (18 years and under) players. Extra caution must be taken to prevent such players returning to play or continuing playing or training if any suspicion of concussion exists.

A second head impact in a player who has not fully recovered from concussion could lead to dangerous neurological complications, including death.

Management of concussion

Removal from play

All players with a diagnosed concussion must be removed from the field of play and not return to play or train on the same day.

Players with a diagnosed concussion must go through a graduated return to play protocol (GRTP).

All non-elite players with a potential concussion must be presumed to have a diagnosed concussion and must be removed from the field of play and not return to play or train on the same day.

Non-elite players with a potential concussion must go through a graduated return to play protocol (GRTP).

Any player who presents with the following signs or symptom **MUST** be permanently removed from the field of play:

- Traumatic convulsion
- Tonic posturing
- Confirmed loss of consciousness
- Suspected loss of consciousness
- Ataxia - unsteady on feet
- Disorientated or confused

Graduated Return to Play

All players diagnosed with a concussion must go through a graduated return to play (GRTP) program as outlined in this document.

All non-elite players with a potential concussion must go through a graduated return to play (GRTP) program.

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As per Zurich 2012, younger athletes who sustain a concussion should be managed more conservatively. Hockey recommends different minimum rest periods and different length GRTP stages for differing age groups - protecting our young athletes.

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

Players up to (but not including) 18 years of age

- 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

Adult - 18 years of age 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.

The management of a GRTP should be undertaken on a case by case basis and with the full cooperation of the player. The commencement of the GRTP will be dependent on the time in which symptoms are resolved and the age of the player. It is important that concussion is managed so that there is physical and cognitive rest (avoidance of activities requiring sustained concentration), until there are no remaining symptoms for a minimum of 24 consecutive hours without medication that may mask the symptoms.

In the early post injury period, rest is defined as *complete physical and cognitive rest*. However, if recovery is delayed, rest is defined as being activity below the level at which physical activity or cognitive activity provokes symptoms.

The Graduated Return to Play Program

Before a player can restart exercise they must have rested for the prescribed minimum rest period AND be symptom free.

The GRTP Program contains six distinct stages:

- The first stage is the recommended rest period for the athlete's age
- The next four stages are training based restricted activity
- Stage 6 is a return to play

Under the GRTP Program, the Player can proceed to the next stage if no symptoms of concussion (SCAT 3 provides the symptom checklist) are shown at the current



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stage (that is, both the periods of rest and exercise during that 24-hour period). If any symptoms occur while progressing through the GRTP protocol, the player must return to the previous stage and attempt to progress again after a minimum 24-hour period of rest has passed without the appearance of any symptoms.

Prior to entering Stage 5, a Medical Practitioner or approved healthcare professional and the Player must first confirm that the player can take part in this stage. Full contact practice equates to return to play for the purposes of concussion. However, return to play itself shall not occur until Stage 6.

The GRTP applies to all situations including 'multiple game-same day' tournaments.

Table 1: GRTP Protocol

Rehabilitation Stage	Exercise Allowed	Objective
1. Rest as per minimum rest period prescribed for player's age	Complete physical and cognitive rest without symptoms	Recovery
2. Light aerobic exercise Walking, swimming or stationary cycling keeping intensity, <70% maximum predicted heart rate. No resistance training.	Symptom free during full 24-hour period	Increase heart rate
3. Sport-specific exercise	Running drills. No head impact activities	Add movement
4. Non-contact training drills	Progression to more complex training drills, e.g. passing drills. May start progressive resistance training	Exercise, coordination, and cognitive load
5. Full contact practice	Normal training activities	Restore confidence and assess functional skills by coaching staff
6. Return to play	Player rehabilitated	Recover

GRTP managed by a medical practitioner or approved Healthcare Professional (HCP)

For GRTP programs managed by a medical practitioner or an approved HCP, the observation of progress may be delegated to a healthcare professional while the management of the program must remain the responsibility of the medical practitioner or approved HCP.

Adolescents and children, 18 years and under, **MUST NOT** return to play without clearance from a medical practitioner or approved healthcare practitioner.
GRTP where no medical or approved healthcare professional practitioner is available

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When a medical practitioner or approved healthcare practitioner is not available to manage

When a medical practitioner or approved healthcare practitioner is not available to manage and review the GRTP, the player **MUST NOT** play until completion of a minimum 2 week rest period and the relevant GRTP for that age.

In addition the process should be observed and managed by someone familiar with the player who could identify any abnormal signs displayed by the player.

Clearance to play by a medical practitioner or approved healthcare practitioner should always be sought.

GRTP conclusion

It is recognised that players will want to return to play as soon as possible following a concussion.

Players, coaches, management, parents and teachers must exercise caution to ensure that:

- all symptoms have subsided fully;
- the GRTP program is followed; and
- the advice of medical practitioners or approved healthcare practitioner is strictly adhered to.

In doing so, all concerned can reduce the risk to a player's career longevity and long term health

If no medical practitioner is available to manage a Graduated Return to Play (GRTP), irrespective of their age, the player **MUST** rest for a minimum of 2 weeks and be symptom free. At the completion of this 2-week rest period, if the player is symptom free they can commence the GRTP with each stage progressing each 24 or 48 hours depending on the age of the player.

All involved in the process of concussion management must be vigilant for the return of symptoms or the possible development of psychological issues after a concussive event. If symptoms reoccur the player must consult a medical practitioner or approved healthcare practitioner.

Those involved in the process of concussion management and/or aware of the return of symptoms should do all they can to ensure that the player consults a medical practitioner or approved healthcare practitioner as soon as possible.

Recurrent or difficult concussions

Following a concussion a player is at an increased risk of a second concussion within the next 12 months. GB & England 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



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- 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.

Factors impacting on the diagnosis and management of concussion

The factors listed below may predict the potential for prolonged or persistent symptoms. Players with these factors should be carefully monitored by experienced practitioners.

Factors	Exacerbating Factors
Symptoms	• Number of concussions suffered historically • Duration of current concussion symptoms (>10 days) • Severity of current concussion
Signs	• Prolonged loss of consciousness (>1 minute) • Amnesia
Sequelae	• Concussive convulsions
Temporal	• Frequency – repeated concussions over time • Timing – injuries close together in time • “Recency” – recent concussion or traumatic brain injury
Threshold	• Repeated concussions occurring with progressively less impact force or slower recovery after each successive concussion - Age • Child (<10 years) and adolescent (10-18 years) - Co- and premorbidities • Migraine, depression or other mental health disorders, attention deficit hyperactivity disorder (ADHD), learning disabilities, sleep disorders
Medication	• Psychoactive drugs, anticoagulants
Behaviour	• Dangerous style of play
Sport	• High risk activity, contact and collision sport, high sporting level

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Conclusion

GB & England 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 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.

GB & England Hockey recommends minimum rest periods for different ages –

U18 years and under – 2 weeks minimum rest

Adults (19 years and older) - 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.

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Baseline Assessments

Where possible, athletes should have baseline NP tests completed so that they can be used for reference and comparison during the GRTP. These tests should be completed at the end of the GRTP, before the player returns to full training but should not be used in isolation. The player should achieve the same, or better, result than their baseline test.

For GB and England squads U16-U21, all should have a minimum of the paper NP tests (Appendix 3) completed annually. For senior squads, the paper NP tests should also be completed annually and, ideally, a baseline SCAT 3 assessment should also be completed.

References

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Acknowledgement

Thanks to the IRB (International Rugby Board) for their permission to use and amend their literature and guidelines in the production of this document