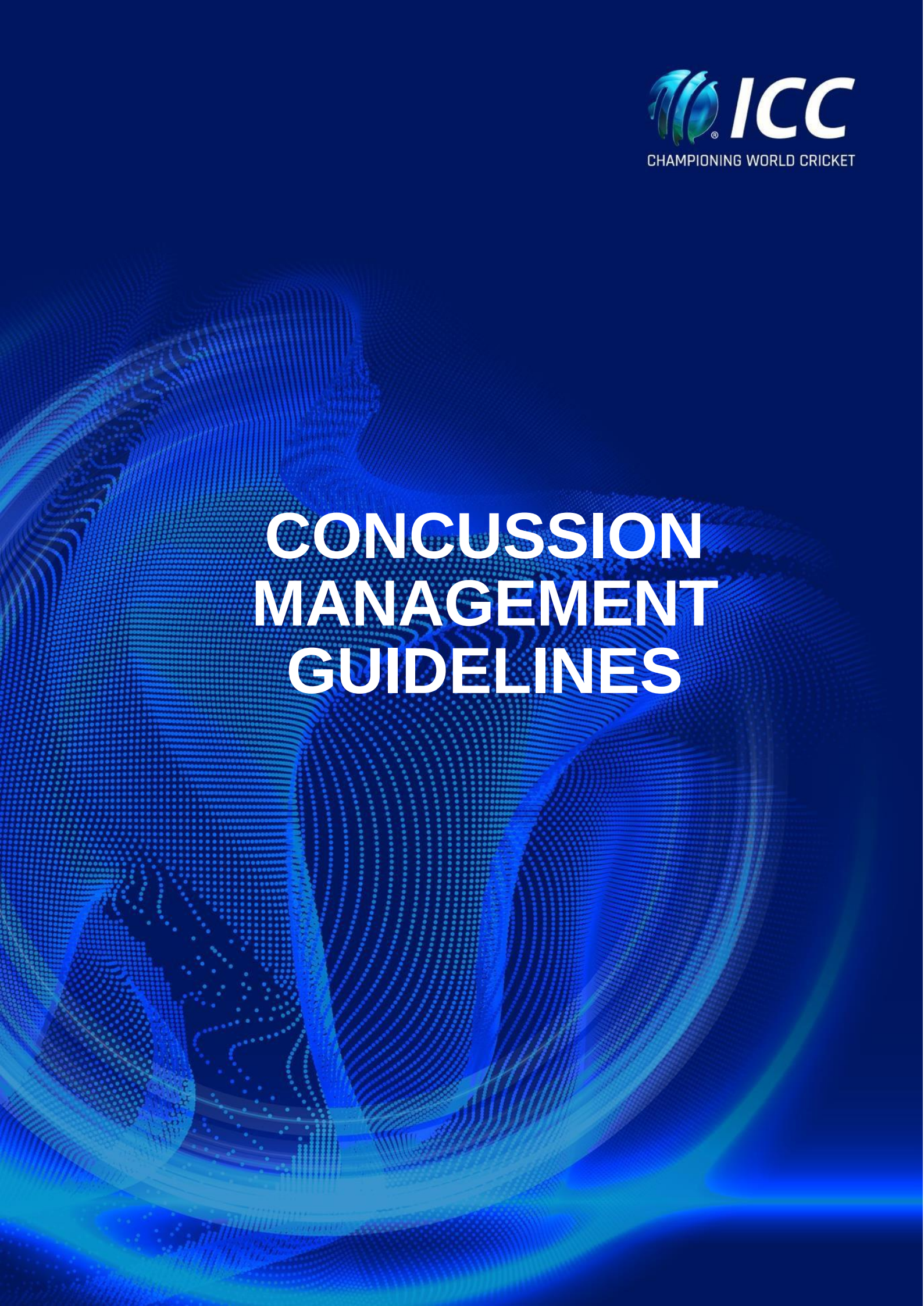
ICC
CHAMPIONING WORLD CRICKET

CONCUSSION MANAGEMENT GUIDELINES



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Introduction

While concussion is not a common injury in cricket and the incidence of repetitive head trauma even less so, nevertheless, due to the potential long and short term health risks associated with head trauma, management guidelines are required.

The ICC's Concussion Management Guidelines follow the guidance provided by the 2022 Amsterdam Concussion Consensus which is current best practice determined by experts who have undertaken extensive review of the scientific literature. The Consensus process commenced in 2001 and has become increasingly robust in the evaluation of emerging scientific research, expert interpretation, and debate to achieve 5 assessment and management resources (**CRT6**, **SCAT6**, **Child SCAT6**, **SCOAT6** and **Child SCOAT6** – links to each of these is in the Resources section).

CRT6 – for recognition of suspected concussion by non-healthcare personnel
SCAT6 – significantly enhanced acute assessment for concussion, valid up to 7 days post injury and used by concussion management trained medical practitioners, physiotherapists, and ED physicians.
SCOAT6 – new office based neurological assessment aligned with the SCAT6 but appropriately allows for a more detailed and time consuming; used 3-30 days post injury and primary use for evaluation of return to play, difficult concussion management and late presentations; allows the integration of additional neurological evaluation resources
Child SCAT6 and **Child SCOAT6** – for use as detailed above for the 2-12 age group
SCAT6 and **SCOAT6** will be available on a linked digital platform at some stage and will be compatible with SCAT5 for longitudinal clinical evaluation purposes.

Purpose

The aim of this resource is to translate the 2022 Amsterdam Concussion Consensus into the context of international cricket, primarily to assist team healthcare practitioners and other

participants in the acute assessment and management of concussion during competition or training. For more information on concussion, it is recommended that team healthcare professionals access the original documents (link provided in the Resources section).

Definition

Sport-related concussion is defined as: *'a traumatic brain injury caused by a direct blow to the head, neck or body resulting in an impulsive force being transmitted to the brain that occurs in sport and exercise activities. This initiates a neurotransmitter and metabolic cascade, with possible axonal injury, blood flow change and inflammation affecting the brain. Symptoms and signs may present immediately, or evolve over minutes or hours, and commonly resolve within days, but may be prolonged. No abnormality is seen on standard structural neuroimaging studies, but in research setting, abnormalities may be present on functional, blood flow or metabolic imaging studies. Sports-related concussion results in a range of clinical symptoms and signs that may or may not involve loss of consciousness. The clinical symptoms and signs of concussion cannot be explained solely by (but nay occur concomitantly with) drug, alcohol, or medication use, other injuries (such as cervical injuries, peripheral vestibular dysfunction) or other comorbidities (such as psychological factors or coexisting medical conditions).'*
These guidelines cover head injuries and concussion during both games and training for both men and women cricketers.

Awareness and preparation

All players, support staff and officials should be aware of the potential health risks of concussion and the ICC Concussion Guidelines, aimed at protecting players from these potential risks.

All participants in the sport need to be aware that any player who has a concussion diagnosed or concussion strongly suspected during a match, must be removed from that match, and only return to competition when cleared by an appropriately qualified healthcare professional experienced in the management of concussion. **In one day or Twenty20 matches, this means**

a concussed or suspected concussed player cannot return to play in that game unless, the diagnosis is reversed by an experienced healthcare practitioner. In a multi-day match, this means that the player must be cleared before they can return to the game.

The ICC, Member Federations, National teams, and their health care personnel are all responsible for raising the awareness of the risks related to head trauma and the need for a more conservative approach to the management of concussion. Team health care personnel need to ensure that they are able to manage the assessment of concussion and understand their own capability limitations in the management of this complex neurological condition. If a team has a physiotherapist as the primary health care provider, that practitioner needs to be specifically trained in the assessment and management of concussion and have back up specialist medical support for advice regarding difficult management decisions. It is inappropriate for the decision of concussion diagnosis to be overruled by a player (who may be cognitively impaired), captain or coach.

Concussion diagnosis background

The diagnosis of concussion is based on symptoms and/or signs of acute neurological dysfunction, altered mental state or cognitive impairment. The symptoms and signs may come on rapidly, evolve over time, have a delayed onset (up to 48 hours), and usually resolve relatively quickly. The condition can present in different ways depending on what aspect of the brain's function has been disturbed. The condition can be difficult to interpret clinically as many of the symptoms and signs are largely non-specific.

Following head trauma, even with a normal neurological examination including SCAT6 assessment soon after that injury, a final diagnosis cannot be made because of the frequent incidence of delayed symptoms of concussion. A final clearance can only be made after delayed onset concussion has been excluded at about 48 hours post-injury. Therefore, on-going monitoring and formal examinations need to be a part of the diagnosis of, or exclusion of, concussion.

Who makes the diagnosis of concussion?

Concussion is a clinical diagnosis made by a qualified healthcare practitioner experienced in a neurological assessment and especially concussion. Ideally this is a medical practitioner but sometimes it is appropriate for a team physiotherapist, who has been trained in concussion assessment, and with the support of an experienced medical practitioner, will be required to diagnose the condition.

If a team physiotherapist is required to fulfill concussion management decisions, they should undertake specific training and have the backup support of an experienced medical practitioner. In circumstances where decisions are made the physiotherapist must consult with a medical practitioner - either the usual team medical personnel or the match day doctor. At no stage should a healthcare practitioner's diagnosis decision be overturned by a non-clinician such as coach or player. The diagnosis is a difficult clinical decision requiring a significant knowledge of neurological examination alongside the potential for significant health risks.

Clear and immediate diagnosis of concussion

Cricket at the elite level has good healthcare support at matches. If during the course of a match, a player receives a significant knock to the head or neck and is unable to immediately resume play, a concussion should be suspected and the most senior member of the team's health care personnel, preferably the team doctor, should immediately attend to the player. From a practical perspective, a player with new (post-trauma) neurological symptoms or signs or any evidence of a disturbed mental state or cognitive function following a significant head

When should a team doctor/physio run out for an on-field assessment following head trauma?

1. *If called on by the umpire;*
2. *If a player is down and players are calling for assistance;*
3. *Immediately, if the player is unable to stand and move after 3 to 4 seconds;*
4. *If a player calls for a new helmet following a head injury; and*
5. *At the end of the over, if the player resumes play after having sustained a blow to the head.*

knock, is considered to have concussion until an alternative diagnosis is confirmed.

If any of the following signs are observed, then the diagnosis of concussion is clear:

- confirmed loss of consciousness
- seizure, convulsion, or tonic posturing (stiffening of any limb)
- ataxia, loss of motor control, inability to stand or staggering
- dazed or blank stare
- player in a confused state, disoriented or with memory impairment

In such circumstances, the player should be immediately removed from the match with the diagnosis of concussion established.

What should an on-field assessment include?

1. *Ask the player if they have any symptoms such as dizziness or headache or just not their normal selves;*
2. *Talk to the player - are they responding inappropriately?*
3. *Does the player have a dazed appearance or a blank stare or does not seem their normal selves;*
4. *Is the player able to stand or walk normally;*
5. *Is the player unable to resume after a 3-4 minute stoppage in play;*
6. *Ask the player modified Maddocks questions relevant to cricket and*
7. *If available check the video of the incident for video signs of clear or suspected concussion.*

If the doctor or physio notes any of the above issues, then the player should be taken off the field immediately for a SCAT assessment.

SCAT6 (link provided in Resources section) must be undertaken with particular reference to the identification of ‘red flags’ and exclusion of the need for urgent neurological assessment at a hospital.

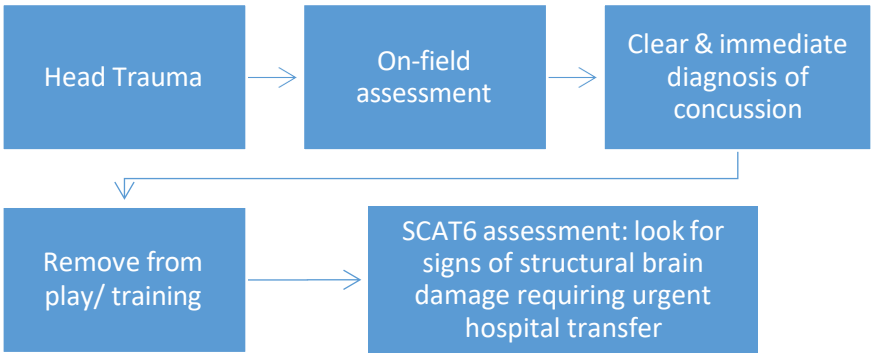


Fig 1. Clear and immediate diagnosis of concussion

Role of the umpire and players on the field

An umpire should call for medical assistance if a player receives a significant head knock and is unable to immediately return to play or has immediate worrying signs such as fitting, loss of consciousness, unsteadiness, or blank stare. A less severe helmet strike/head injury should demand immediate medical attendance if a player appears to have any of the above signs.

The team doctor or the appropriate member of the team's health care team should be immediately called onto the field to assess the player. In such circumstances, the observations of the umpire or players on the field should be passed onto the doctor or physiotherapist.

The umpire may be called to intervene if a player refuses to leave the field in circumstances where a team medical representative insists that a neurological assessment (SCAT6) is indicated, or the player has been diagnosed with concussion (it is important to remember that the player may be cognitively impaired).

Role of a video review

If video of the injury incident is available, it must be reviewed before a final diagnosis is made. This can occur after the player has been attended to on the field of play or may help inform management if the incident was missed.

The purpose of this review is to observe the mechanism of the trauma, assist with determining whether immediate signs of concussion were present and missed in the direct observation of an incident (e.g. prolonged immobility, tonic posturing, ataxia, and

lack of defensive action in a fall).

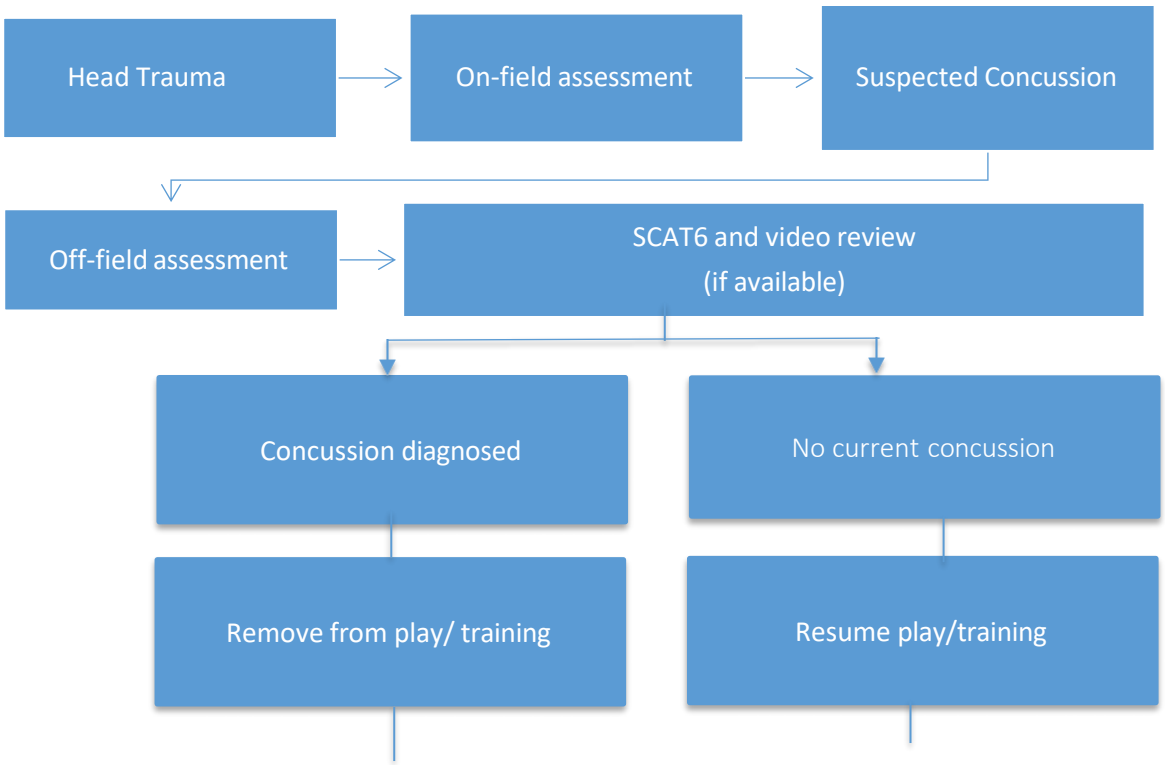
If signs of a significant impact (e.g. a direct frontal blow to the helmet) and/or suspected concussion are present following the video review, the player should be immediately removed from the field of play with the need for SCAT6 examination.

Suspected diagnosis of concussion (where the diagnosis is not clear on the initial attendance)

In circumstances where there has been a head or neck blow and following assessment on the field, the diagnosis is not obvious but there are potential symptoms or signs of concussion, such as:

- the player complains of a headache or dizziness
- is unable to resume playing in 3-4 minutes
- the player 'seems' not to be their normal self
- there was the 'possibility' of the player being unsteady on their feet

The player should be removed for further neurological assessment in the medical room and the video reviewed. This assessment should closely follow the SCAT6 and will take about 15 minutes.



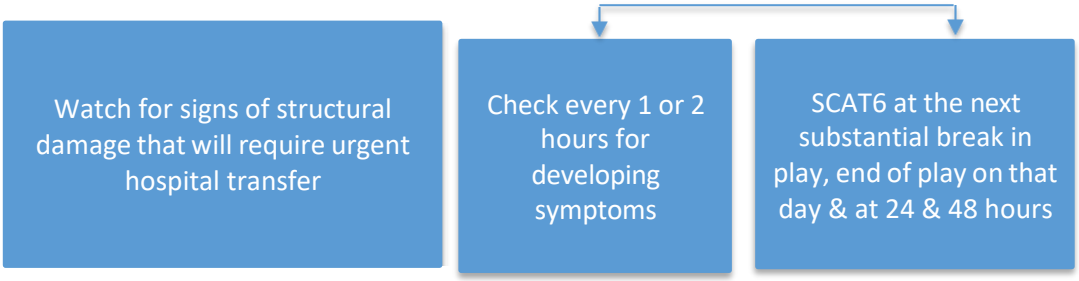


Fig 2. Suspected diagnosis of concussion

Concus ed onset concussion)

Approximately 20% of concussion cases have a delayed onset. In a technical sense, concussion can only be totally excluded 48 hours after an incident of significant head or neck trauma.

If following an on-field assessment, concussion is excluded (bearing in mind the fore listed symptoms and signs), the player may resume playing and the healthcare professional review the video of the incident to fully exclude the diagnosis.

If following an off-field assessment (including a **SCAT6**), concussion is not diagnosed, the player may return to the match.

However, in both situations, because of the potential evolving nature of any brain dysfunction and delayed concussion onset, the player should be observed and checked regularly (if practical, initially about every 1 or 2 hours), looking for developing symptoms or signs of concussion. A player must be removed from the match if concussion symptoms develop.

Finally, a formal assessment should be repeated after the match or day's play and again about 24 to 48 hours later, utilising the SCAT6 (i.e. before start of play on the following day) to fully exclude concussion.

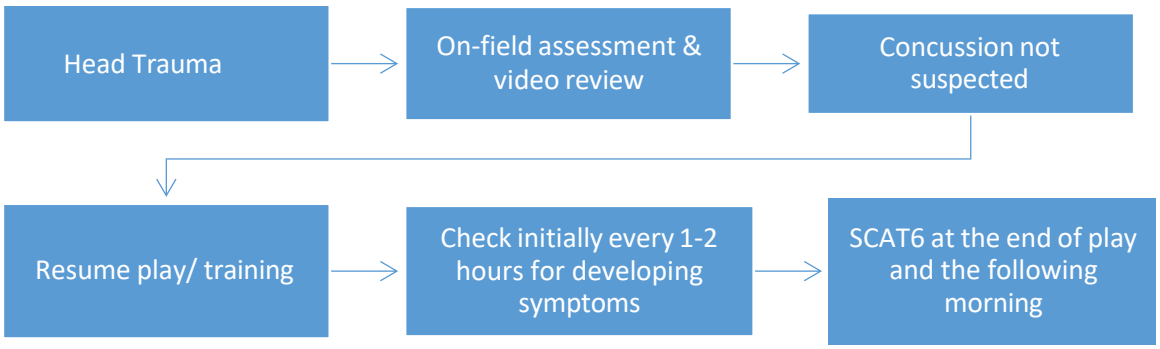


Fig 3. Concussion not suspected

Concussion diagnosis

Whether by directly observed or video signs or symptoms or following neurological examination including the **SCAT6**, if the diagnosis of concussion is made, the player should be immediately removed from further participation in the match or training on that day and not permitted to return until cleared by a health care practitioner, ideally a medical practitioner, who is trained and experienced in the assessment and management of concussion.

Immediate management of concussion

At a match or training

A player diagnosed with concussion must be immediately removed from further participation in the match or training on that day. Because of this requirement, the initial focus of management is to diagnose or exclude concussion and identify early signs of a serious structural head injury. All healthcare professionals who undertake this role must be trained in the diagnosis and management of concussion.

If a player diagnosed with concussion or suspected concussion has or develops signs of a more serious brain injury, then the player should be urgently transferred to a hospital with a neurosurgical unit.

Signs of a possible serious structural brain injury maybe identified during the initial part of the **SCAT6** assessment or later by observing:

- deteriorating conscious state
- subsequent convulsion or seizure
- double vision
- accelerating symptoms such as headache or vomiting
- focal neurological signs or symptoms in the limbs such as weakness or altered sensation
- neck pain or tenderness
- increasing agitation, irritability, or combativeness

Rehabilitation

The latest Consensus describes a graded return to play process leading to a formal medical clearance. Each stage of the rehabilitation should be reviewed to ensure that concussion symptoms have not returned. Generally, concussion symptoms will settle within 2-3 days and a player diagnosed with concussion is ready to return in about a week but in some individuals this time might be shorter or longer. Experienced medical oversight, as occurs in elite teams, is essential if a player is to return to play within a week or on a subsequent day of a multi-day match. A team physiotherapist may fulfill this role in the absence of a team doctor if they have been specifically trained and have had supervised experience in the management of concussion and have adequate specialist medical advice available. An experienced match day doctor can support the process under these circumstances.

Typical graded return to play for cricket usually takes at least 7 days and includes:

- *24 hours 'relative' rest (can do limited daily activity)*
- *light aerobic exercise (such as walking)*
- *light training*
- *full training*
- *formally cleared to compete*

If at any of the above stages 'mild' symptoms return, the player should stop the activity. If the symptoms are more than 'mild' the player should drop back an exercise level.
If the player is a student they may require 2-3 days off school and a staged return over a few days depending on symptoms. A player should not return to full training if unable to attend school or work without symptoms returning.

Return to play

This is highly individual. A concussed player requires a formal medical clearance to return to training and play and never on the day of the injury. The clearance examination should ideally utilize the **SCOAT6** protocol (see link in the Resources section), review the rehabilitation progress, consider specific individual aspects (e.g. education impact, mental health impact, past history, competition demands) and utilize any other neurological evaluation resource available such as online neurological cognitive testing, specialist neuropsychological testing or any other indicated specialist test.
Usually, a player will recover in 9-12days, but this can vary from individual to individual (the average is about 20 days), meaning a player cannot return to a multi-day game.

If at any stage during an individual's recovery a return to play is contemplated before 9 days an **independent** specialist neurological examination, utilizing **SCOAT6** is required.

A player who is 18 years or younger will typically require a longer period of rehabilitation prior to return to play and require a medical practitioner with concussion management experience to oversee the care.

Difficult concussion management

If the concussion symptoms continue for more than 2 weeks a player should be referred to a specialist who is experienced in the management of concussion. The player should be referred for a full neuropsychological assessment, utilizing **SCOAT6**, and a standard MRI to exclude structural brain damage. Other investigations will be undertaken as determined by the specialist neurological examination.

In difficult cases, the specialist, in collaboration with the team doctor, is responsible for clearing the player to return to full training and competition.

Online neurocognitive testing

Neurocognitive testing such as Cogsport and ImPACT are useful adjuncts to **SCAT5**, **SCOAT6** and baseline evaluations of players. They do not replace the full domain testing of the **SCAT5** and **SCOAT6**.

Formal neuropsychological assessment

Formal neuropsychological assessment is indicated in the management of difficult concussion, i.e. players with persistent symptoms or signs, escalating symptoms related to separate concussion incidents and/or potential retirement decisions related to concussions.

Baseline testing

Baseline testing is a useful adjunct to the neurological assessment and in tracking recovery. This may utilise the **SCAT6**, online systems such as Cogsport and ImPACT or pen and paper cognitive screening tools. Generally, the more neurological function that can be tested will inform management.

Baseline testing is recommended for elite teams. It is not recommended for community level sport. If baseline testing had been undertaken this will be useful in assessing the validity of SCAT6 findings in acute cases. Any baseline neurophysiological testing is an adjunct to a neurological assessment and any final decision must be by a trained healthcare professional interpreting all the clinical information.

Community level competition

At the community level, a cricket match is highly unlikely to have a trained healthcare professional present. Therefore, any possibility of concussion mandates the player be

removed from play and referred to a medical practitioner for management of concussion.

The Consensus has developed a concussion recognition tool and this document will assist parents and coaches in recognising the possibility of concussion (see links in the Resources section).

Concussion in children (18 years and below)

Managing the identification of concussion in children requires a more conservative approach. The **Child SCAT6** has been developed for use by medical professionals for the assessment of children between the ages 5-12 years. For players aged 13 years or older, the **SCAT6** can be used.

Rehabilitation of children is slower with a longer rehabilitation period, typically about 3 weeks prior to return to play and the oversight of an experienced medical practitioner. Initial attention should be to remove the child from school and closely monitor symptoms related to schoolwork and then exercise and sport.

If symptoms persist for 3 weeks, the child should be referred to a pediatric concussion specialist.

Concussion replacement

International cricket allows for a concussion replacement in the playing conditions. These rules should be followed under such circumstances.

RESOURCES

1. Consensus statement on concussion in sport: the 6th International Conference on Concussion in Sport - https://bjsm.bmj.com/content/57/11/695

2. CRT6 - https://bjsm.bmj.com/content/bjsports/57/11/692.full.pdf

3. SCAT6 - http://www.sportsconcussion.co.za/sportconcussion/wp-content/uploads/2023/07/SCAT6-v6.pdf

4. Guidelines to using SCAT6 - http://www.sportsconcussion.co.za/sportconcussion/wp-content/uploads/2023/07/SCAT6-Instructions-v9.pdf

5. Child SCAT6 - http://www.sportsconcussion.co.za/sportconcussion/wp-content/uploads/2023/07/Child-SCAT6-v5.pdf

6. Guidelines to using Child SCAT6 (ages 8-12 years) - http://www.sportsconcussion.co.za/sportconcussion/wp-content/uploads/2023/07/Child-SCAT6-Instructions-v7.pdf

7. SCOAT6 - http://www.sportsconcussion.co.za/sportconcussion/wp-content/uploads/2023/07/SCOAT6-v8.pdf

8. Guidelines to using SCOAT 6 - http://www.sportsconcussion.co.za/sportconcussion/wp-content/uploads/2023/07/SCOAT6-Instructions-v6.pdf

9. Child SCOAT - https://bjsm.bmj.com/content/bjsports/57/11/672.full.pdf

10. Guidelines to using Child SCOAT 6 - http://www.sportsconcussion.co.za/sportconcussion/wp-content/uploads/2023/07/Child-SCOAT6-Instructions-v6.pdf

11. Dr Ruben Echemendia, PhD, University of Michigan Concussion Centre Clinic: presentation on the 2022 Consensus and changes to the concussion recognition and assessment tools - https://www.youtube.com/watch?v=5P0Jj5wT9GY

12. Clark & Olson SCAT6 Application Demonstration: a useful example of the SCAT6 examination - https://www.youtube.com/watch?v=ASA-o29HWHI

Head Trauma Assessment

(Following on-field assessment by a team doctor or physio)