**Basketball Concussion Management Guidelines**

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## Introduction

These guidelines for the management of concussion are based on the published FIBA Concussion Guidelines which follow the guidance provided by the 2016 Berlin Concussion Consensus.

## Definition

Concussion is a temporary disturbance of brain function that has been described as 'a complex pathophysiological process affecting the brain, induced by biomechanical forces' (1). It is potentially a serious injury that may have long term sequelae and therefore requires a conservative management approach.

Any basketball player who has a concussion diagnosed by a doctor during a game must not have any further participation in that game and cannot train or play until medically cleared by a team physician or medical practitioner experienced in the management of concussion.

At the community level where a doctor is unlikely to be present, if a concussion is suspected then the player should not participate in that game until cleared by a doctor.

See the links below to the Concussion Recognition Tool and the Headcheck Application (a concussion management tool for parents and children).

## Diagnosis

The diagnosis of concussion is a clinical one with symptoms and/or signs of acute neurological dysfunction, altered mental state or cognitive impairment. These symptoms and signs can come on rapidly, will evolve over time and spontaneously resolve. Concussion can present in many different ways depending on what aspect of the brain's function has been effected. The

condition can sometimes be difficult to diagnose because the symptoms and signs are largely non-specific and mimics other brain conditions. For this reason a doctor is required to make or confirm the diagnosis.

The current SCAT is a multimodal assessment protocol which should be undertaken by a medical practitioner (preferably experienced in the management of concussion) and include a symptoms checklist, assessment of orientation, memory, balance, co-ordination and cognitive functioning. A doctor may choose to perform additional neurological tests.

If video of the injury incident is available this should be reviewed as a part of the initial examination to determine the mechanism of injury and presence or absence of immediate signs of concussion.

From a practical perspective, a player with any neurological symptoms or signs or any evidence of a disturbance of mental status or cognitive function following trauma, is considered to have concussion and should be removed from play.

**Management during a game**

A player diagnosed with concussion cannot be permitted to continue competing in a game. Because of this requirement the first focus of management is to diagnose or exclude concussion. If there is doubt the player should be sat out for the remainder of the game.

If a player is directly observed (including video review) to have loss of

**Immediate and obvious signs of concussion, directly observed or on video review**

1. Loss of consciousness or prolonged immobility
2. No protective action in fall to floor
3. Impact seizure or tonic posturing one or more limbs
4. Confusion, disorientation
5. Memory impairment
6. Balance disturbance, unsteady on feet or ataxia
7. Player reports concussion symptoms
8. Dazed, blank stare, not their normal selves
9. Behaviour change atypical of the player

**The player should be immediately removed from play and take no further part in the game**

consciousness, prolonged immobility, tonic posturing or seizure, loss of balance or ataxia, dazed with a blank stare, then the provisional diagnosis of concussion is made. The player should be removed from play and examined using the SCAT protocol.

If a player suffers head trauma and requires medical assessment, but there are no clear signs of concussion as listed above, the player will require a full SCAT multimodal assessment by a doctor in a quiet location (not courtside) to fully exclude concussion.

From a practical perspective, if during a game, play is stopped by the referee when there has been a head injury to a player and the doctor called onto the court, a SCAT assessment should be undertaken unless an alternative explanation is obvious.

Concussion is a clinical syndrome that can have a delayed onset or evolve over time. Therefore, any player with a head injury should be reviewed regularly during a game and formally assessed after the game and 48 hours later. After the game the player should be instructed on what symptoms and signs to look for and instructed to report these should they occur.

All details of the clinical assessment should be kept in the normal medical notes.

**Emergency care**

A player diagnosed with concussion should have a through neurological examination to exclude more serious structural injuries to the brain, head and neck. If there are signs of a more serious condition being present, then the player should be immediately transferred to a hospital with neurosurgical services.

Signs suggestive of a more serious head injury are:

- Deteriorating mental state or consciousness
- Increasing drowsiness
- Repeated vomiting
- Deteriorating symptoms such as headache or intolerance of light
- Loss of muscle function

If a player has any of these signs an ambulance should be called to transfer the player to a hospital emergency department.

**Return to play**

A concussed player will require a medical clearance to return to training and competition.

Usually a player will have recovered within 7 to 10 days but this can vary from individual to individual and requires a doctor's oversight.

**Graded return to play – each stage takes a full day**

1. No return to play and at least 24 hours relative rest
2. Light aerobic exercise and easy basketball skills such as free throws and shooting
3. Light training for a limited time and with no body contact, e.g. half court scrimmage for 20 to 30 minutes followed by basketball skills
4. Fill scrimmage with a medical clearance to train and play
5. Return to play

**Any return of symptoms requires a return to the previous level of activity for 24 hours**

A concussed player will undertake a graded return to play where the various stages of sporting function are monitored by looking for symptom return.

If baseline testing had been undertaken (e.g. computerized cognitive testing such as CogState or ImPACT, SCAT or written cognitive assessment) this should also return to baseline before a player can return to basketball. This neurophysiological testing is an adjunct to a neurological assessment. Mental state assessments may also be undertaken to assist in the examination.

**Baseline testing**

Baseline testing of cognitive function and balance is recommended for elite and professional basketball players ONLY. Typically this involves online cognitive tools such as CogState or ImPACT as well as the SCAT balance testing.

For sub-elite basketball it is reasonable to initiate these types of tests as a part of rehabilitation without pre-concussion baseline testing.

From a practical perspective if the there is no team doctor the player will require at least 2 external medical assessments. The first to confirm the diagnosis and commence the rehabilitation and the second to clear the player for full training and play.

A student may require a couple of days off school to rest and a player should not return to full training if still unable to attend school or work.

**Difficult concussion**

If the condition continues more than 3 weeks with persistent symptoms, then the player should be referred to a neurologist who is experienced in the management of concussion. More than likely the player will be referred for a full neuropsychological assessment and may require 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 neurologist is responsible for clearing the player to return to full training and competition.

**Community level basketball**

Where a doctor is not readily available a team official, either the manager of the coach, should carry the Concussion Recognition Tool and be familiar with its' use. It is a simple assessment that can be done by a non-trained individual.

See the links below to the Concussion Recognition Tool (CRT) and the Headcheck phone app (a free concussion recognition resource for parents and children).

**References**

1. McCrory P, Meeuwisse WH, Aubry M, Cantu B, Dvorak J, Echemendia RJ, et al. Consensus Statement On Concussion In Sport - The 4th International Conference On Concussion In Sport Held In Zurich, November 2012. British Journal of Sports Medicine. 2013;47(5):1-11. Eng.

**Links**

*Concussion consensus*

http://bjsm.bmj.com/content/47/5/250

https://en.wikipedia.org/wiki/Concussions_in_sport

*NBA*

http://official.nba.com/2015-16-nba-concussion-policy/

http://www.csnne.com/boston-celtics/with-al-horford-out-nba-concussion-protocol-explained

*Incidence*

http://journals.sagepub.com/doi/abs/10.1177/0363546516634679

*SCAT5*

https://bjsm.bmj.com/content/bjsports/early/2017/04/26/bjsports-2017-097506SCAT5.full.pdf

*Community level sport – Concussion Recognition Tool (CRT)*

https://sportconcussion.com.au/wp-content/uploads/2016/02/Concussion_Recognition_Tool5.pdf

*Child SCAT*

http://www.aflcommunityclub.com.au/fileadmin/user_upload/Health_Fitness/Child_SCAT5.pdf

*Headcheck*

https://itunes.apple.com/au/app/headcheck/id887756402?mt=8