



THE MANAGEMENT OF CONCUSSION IN AUSTRALIAN FOOTBALL

AFL RESEARCH BOARD AFL MEDICAL
OFFICERS' ASSOCIATION



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This document has been published by the AFL as a position statement on the management of concussion in Australian Football. It is based on guidelines developed by the AFL Medical Officers' Association which incorporate research that has been funded by the AFL Research Board and which was undertaken by Dr Michael Makdissi, Assoc Prof Paul McCrory and Assoc Prof Gavin Davis.

The guidelines should be adhered to at all times. Decisions regarding return to play after concussive injuries should only be made by a medical doctor with experience in concussive injuries.

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For trainers, first-aid providers, coaches, club officials and parents

Summary

- » In the best practice management of concussion in sport, the critical element remains the welfare of the player, both in the short and long term.
- » Concussion refers to a disturbance in brain function that results from trauma to the brain. The changes are temporary and the majority of players recover completely if managed correctly.
- » Complications can occur if the player is returned to play before they have recovered from their concussion. This is why any player with suspected concussion must be withdrawn from playing or training immediately. Furthermore, no player with concussion should be returned to play in the same game.
- » Management of head injury is difficult for non-medical personnel. In the early stages of injury it is often not clear whether you are dealing with a concussion or there is a more severe underlying structural head injury.
- » Therefore, ALL players with concussion or suspected of concussion need an urgent medical assessment.
- » In the days or weeks following concussion, a player should not be allowed to return to play or train until they have had a formal medical clearance.
- » The key components of management of concussion include:
 - a) **Suspecting the diagnosis in any player with symptoms such as confusion or headache after a knock to the head;**
 - b) **Referring the player for medical evaluation; and**
 - c) **Ensuring the player has received medical clearance before allowing them to return to a graded training program.**



Background

Introduction

In considering the best practice management of concussion in sport, the critical element remains the welfare of the player, both in the short and long term.

- » Since 2001, three international conferences have been held to address key issues in the understanding and management of concussion in sport. Following each of these meetings, a summary has been published to “improve the safety and health of athletes who suffer concussive injuries during participation in sport”. The most recent conference was held in Zurich in November 2008. The summary from the Zurich meeting provides the most up-to-date knowledge on concussion in sport. It also outlines the current best practice management guidelines.(1)

The AFL Medical Officers’ Association (AFLMOA) has recently modified its guidelines for the evaluation and management of concussion. These guidelines are based on the Zurich summary as well as research conducted on concussion in Australian football over a number of decades. Following the guidelines will help ensure that the health and wellbeing of players is protected.

What is concussion?

“Traumatic brain injury” is the broad term used to describe injuries to the brain that are caused by trauma. The more severe injuries typically involve structural damage, such as fractures of the skull and bleeding in the brain. Structural injuries require urgent medical attention. Concussion typically falls into the milder spectrum of traumatic brain injury and reflects a disturbance in brain function. Concussion does not involve structural damage or any permanent injury to the brain tissue.

Concussion is caused by trauma to the brain, which can be either direct or indirect (e.g. whiplash injury). When the forces transmitted to the brain are high enough, they can “stun” the nerves and affect the way in which the nerves function. This results in a range of symptoms and signs depending on the area of the brain that is affected. Common symptoms of concussion include headache, blurred vision, dizziness, nausea, balance problems, fatigue and feeling “not quite right”. Other common features of concussion include confusion, memory loss and reduced ability to think clearly and process information. Loss of consciousness is seen in only 10-20% of cases of concussion in Australian football. That is, the footballer does not have to lose consciousness to have a concussion.

Because we are dealing with a functional injury rather than structural damage, the changes are temporary and recover spontaneously if managed correctly. The recovery process however, is variable from person to person and injury to injury. Most cases of concussion in Australian football recover within 10-14 days of injury, however in a small number of cases, recovery is delayed over weeks to months.

How common is concussion in Australian football?

Concussion is a relatively common injury in Australian football. The overall incidence rate is 5-6 concussions per 1000 player hours, which equates to an average of 6-7 injuries per team per season. The rate of concussion is similar in all levels of competition.

What are the potential complications following concussion?

A number of complications can occur following concussion. These include:

- » Higher risk of injury or repeated concussion on return to play;
- » Prolonged symptoms (lasting → 14 days);
- » Symptoms of depression and other psychological problems;
- » Severe brain swelling (particularly in young players); and
- » Long term damage to brain function.

In general, complications are not common. The risk of complications is thought to be increased by allowing a player to return to play before they have recovered. This is why it is important to recognise concussion, make the diagnosis and keep the player out of training and competition until the player has recovered.

Management guidelines

An outline of the overall management approach is summarised in figure 1 below.

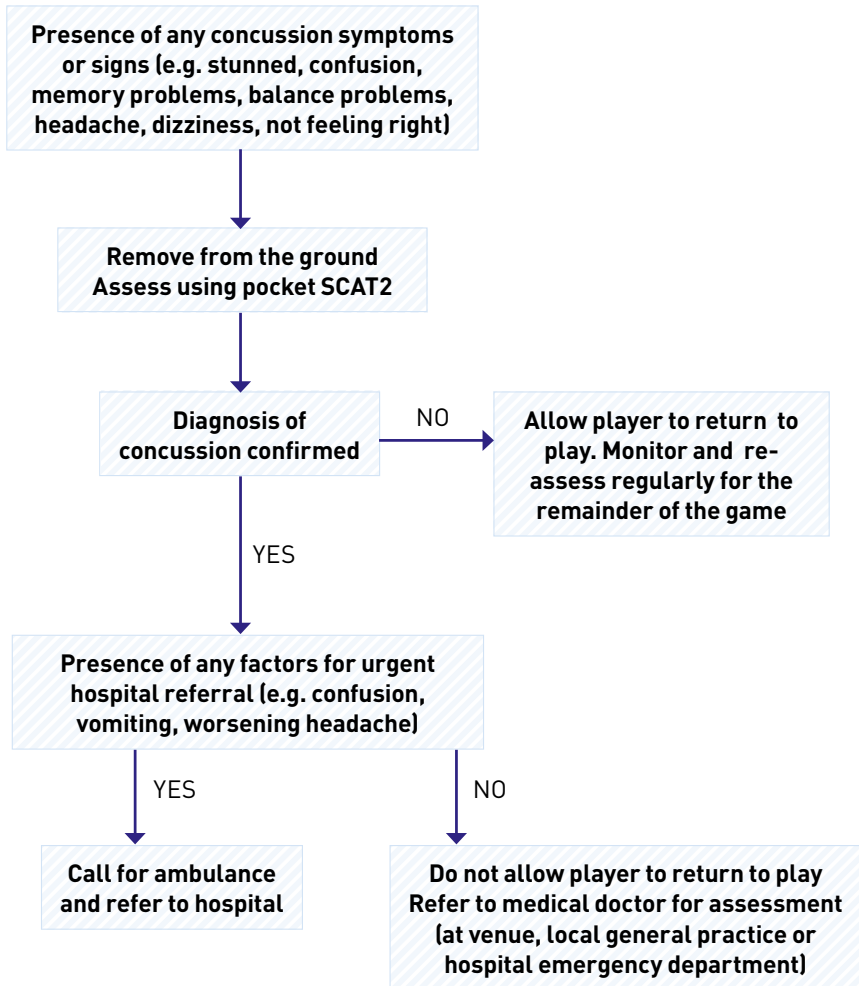


Figure 1. Summary of the management of concussion in Australian football.

*Note: for any player with loss of consciousness, basic first aid principles should be used (i.e. Airways, Breathing, CPR...). Care must also be taken with the player's neck, which may have also been injured in the collision. An ambulance should be called, and these players transported to hospital immediately for further assessment and management.

A. Game-day management

The most important steps in the initial management of concussion include:

1. **Recognising the injury;**
2. **Removing the player from the game; and**
3. **Referring the player to a medical doctor for assessment.**

1. RECOGNISING THE INJURY (MAKING A DIAGNOSIS OF CONCUSSION)

- » Loss of consciousness, confusion and memory disturbance are classical features of concussion. The problem with relying on these features to make a diagnosis of concussion is that they are not present in every case.
- » Other symptoms that should raise suspicion of concussion include: headache, blurred vision, balance problems, dizziness, feeling “dinged” or “dazed”, “don’t feel right”, drowsiness, fatigue, difficulty concentrating or difficulty remembering.
- » Tools such as the Pocket Sport Concussion Assessment Tool (Pocket SCAT2, see appendix) can be used to help make the diagnosis of concussion.
- » It is important to note however that brief sideline evaluation tools (such as the Pocket SCAT2 and SCAT2) are designed to help make a diagnosis of concussion. They are not meant to replace a more comprehensive medical assessment and should never be used as a stand-alone tool for the management of concussion.

2. REMOVING THE PLAYER FROM THE GAME

- » Any player with a suspected concussion must be removed from the game. This allows the first aid provider time and space to assess the player properly.
- » Any player who has suffered a concussion should not be allowed to return to play in the same game. Do not be swayed by the opinion of the player, trainers, coaching staff or others suggesting premature return to play.

3. REFERRING THE PLAYER TO A MEDICAL DOCTOR FOR ASSESSMENT

- » Management of head injury is difficult for non-medical personnel. In the early stages of injury, it is often not clear whether you are dealing with a concussion or there is a more severe underlying structural head injury.
- » For this reason, ALL players with concussion or a suspected concussion need an urgent medical assessment (with a registered medical doctor). This assessment can be provided by a medical doctor present at the venue, local general practice or hospital emergency department.
- » If a doctor is not available at the venue, then the player should be sent to a local general practitioner or hospital emergency department.
- » It is useful to have a list of local doctors and emergency departments in close proximity to the ground in which the game is being played. This resource can be determined at the start of each season (in discussion with the local medical services).
- » A pre-game checklist can be printed on the back of the SCAT2 assessment card and provided to trainers and other staff involved in the match-day care of players. The checklist should include contact details for:
 - a) Local general practices;**
 - b) Local hospital emergency departments; and**
 - c) Ambulance services.**
- » The pre-game checklist can also be provided to trainers and medical staff of the away team, who are likely to be less familiar with local medical services.

MANAGEMENT OF AN UNCONSCIOUS PLAYER AND WHEN TO REFER TO HOSPITAL

- » Basic first aid principles should be used when dealing with any unconscious player (i.e. Airway, Breathing, CPR...). Care must be taken with the player's neck, which may have also been injured in the collision.
- » Urgent hospital referral is necessary if there is any concern regarding the risk of a structural head or neck injury.
- » Indications for urgent referral to hospital include:
 - a) **Any player with loss of consciousness or seizures**
 - b) **Any player with persistent confusion**
 - c) **Any player who deteriorates after their injury (e.g. increased drowsiness, headache or vomiting)**
 - d) **Any player who reports neck pain or spinal cord symptoms (e.g. numbness, tingling, weakness)**
- » Overall, if there is any doubt, the player should be referred to hospital.

B. Follow-up management

- » Any concussed player must not be allowed to return to play before having a medical clearance.
- » In every case, the decision regarding the timing of return to training should be made by a medical doctor with experience in managing concussion.
- » In general, a more conservative approach (i.e. longer time to return to sport) is used in cases where there is any uncertainty about the player's recovery ("if in doubt sit them out").
- » A more conservative approach should also be used for younger players (under 18) as there is some evidence that concussion in this group is more severe, longer lasting and associated with higher risk of complications.

RETURN TO PLAY

- » Players should be returned to play in a graduated fashion.
- » The “concussion rehabilitation” program should follow a step-wise symptom limited progression, for example:
 - 1. Rest until symptoms recover (includes physical and mental rest)**
 - 2. Light aerobic activity (e.g. walking, swimming or stationary cycling) – can be commenced 24-48 hours after symptoms have recovered**
 - 3. Light, non-contact training drills (e.g. running, ball work)**
 - 4. Non-contact training drills (i.e. progression to more complex training drills, may start light resistance training. Resistance training should only be added in the later stages)**
 - 5. Full contact training – only after medical clearance**
 - 6. Return to competition (game play)**
- » There should be approximately 24 hours (or longer) for each stage.
- » Players should be symptom-free during their rehabilitation program. If they develop symptoms at any stage, then they should drop back to the previously symptom-free level and try to progress again after a further 24 hour period of rest.

REFERENCES

1. McCrory P, Meeuwisse W, Johnston K, Dvorak J, Aubry M, Molloy M, et al. Consensus Statement on Concussion in Sport: the 3rd International Conference on Concussion in Sport held in Zurich, November 2008. Br J Sports Med. 2009 May;43 Suppl 1:i76-90.

Pocket SCAT2

Sport Concussion Assessment Tool 2



FIFA®



Concussion should be suspected in the presence of **any one or more** of the following: symptoms (such as headache), or physical signs (such as unsteadiness), or impaired brain function (e.g. confusion) or abnormal behaviour.

1. SYMPTOMS

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

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

2. MEMORY FUNCTION

Failure to answer all questions correctly may suggest a concussion.

"What venue are we at today?"

"Which half is it now?"

"Who scored last in this game?"

"What team did you play last week / game?"

"Did your team win the last game?"

3. BALANCE TESTING

Instructions for tandem stance

"Now stand heel-to-toe with your non-dominant foot in back. Your weight should be evenly distributed across both feet. You should try to maintain stability for 20 seconds with your hands on your hips and your eyes closed. I will be counting the number of times you move out of this position. If you stumble out of this position, open your eyes and return to the start position and continue balancing. I will start timing when you are set and have closed your eyes."

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

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