



THE MANAGEMENT OF

# CONCUSSION IN AUSTRALIAN FOOTBALL

WITH SPECIFIC PROVISIONS FOR  
CHILDREN AGED 5-17 YEARS



AFL CONCUSSION WORKING  
GROUP SCIENTIFIC COMMITTEE

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

## Summary

- › *Head impacts can be associated with serious and potentially fatal brain injuries.*
- › 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, the most important steps in initial management include:
  1. Recognising a suspected concussion;
  2. Removing the player from the game; and
  3. Referring the player to a medical doctor for assessment.
- › Any player who has suffered a concussion or is suspected of having a concussion must be medically assessed as soon as possible after the injury and must NOT be allowed to return to play in the same game/practice session.
- › There should be an accredited first aider at every game and the basic rules of first aid should be used when dealing with any player who is unconscious or injured.

- › Any concussed player must not be allowed to return to school or return to sport before having a medical clearance.

## For children and adolescents (players aged 5-17 years)

- › Symptom evaluation in the child often requires the addition of parent and/or teacher input.
- › The child is not to return to football, or other sport, until he/she has successfully returned to school/learning, is symptom-free, and has received medical clearance. However early introduction of limited physical activity is appropriate, as long as symptoms do not worsen.
- › It is reasonable for a child to miss a day or two of school after concussion, but extended absence from school is uncommon.

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 Concussion Working Group Scientific Committee.

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 expertise in concussion.

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GAVIN DAVIS, MICHAEL MAKDISSI, PETER HARCOURT,  
PATRICK CLIFTON, DAVID MADDOCKS, PAUL MCCRORY  
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# Background

## Introduction

In considering the best practice management of sport-related concussion (SRC), the priority remains the short- and long-term welfare of the player.

Since 2001, five international meetings have been held to address key issues in the understanding and management of SRC. 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 Berlin in October 2016. The summary from the Berlin meeting provides the most up-to-date knowledge on SRC. It also outlines the current best practice management guidelines.<sup>(1)</sup>

**In general, children require a different approach from adults because their brains are developing, and they need to continue learning and acquiring knowledge. As such, the priority is not just player welfare and return to sport, but a critical element is return to school and learning.**

## What is concussion?

Head impacts can be associated with serious and potentially fatal brain injuries. “Traumatic brain injury” is the broad term used to describe injuries to the brain that are caused by trauma. The more severe injuries usually 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 is thought to reflect a temporary disturbance in brain function, rather than structural damage or any permanent injury to the brain.

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 brain functions. This results in a range of observable signs (such as lying motionless on the ground, blank or vacant look, balance difficulties or motor incoordination, etc) or symptoms reported by the player (such as 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. It is important to note that loss of consciousness is seen in only 10-20 per cent of cases of concussion in Australian Football. That is, the footballer does not have to lose consciousness to have a concussion.

## How long does it usually take to recover from concussion?

The recovery process following concussion varies 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 may take weeks to months. In general, children and adolescents take longer to recover, and typically take up to four weeks to recover.

The presence of concussion is occasionally associated with a neck injury, and may be difficult to assess in the early period after head trauma. All concussed athletes should be considered to have a neck injury until medically cleared.

## How common is concussion in Australian Football?

Concussion is a relatively common injury in Australian Football. At the elite level, the overall rate of concussion is 6-8 per 1000 player hours (one approximately every three matches for a team of 22 players).

## What are the potential complications following concussion?

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

- › Higher risk of further concussion or other injuries on return to play;
- › Prolonged symptoms (lasting > 14 days in adults; >four weeks in children/adolescents);
- › Symptoms of depression and other psychological problems; and
- › Long-term damage to brain function.

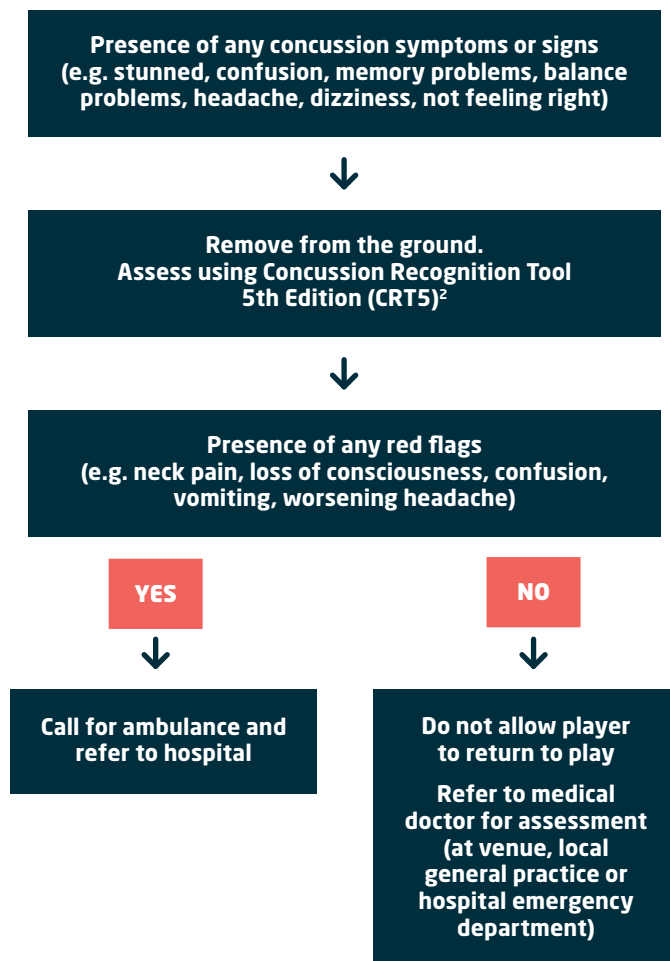
It is important to be aware that any knock to the head can result in severe brain swelling, particularly in younger players.

In general, complications are not common. The risk of complications is thought to be increased by allowing a player to return to sport before they have recovered. This is why it is important to recognise concussion, and keep the player out of full-contact training and games until they have fully recovered.

Concussion symptoms can cause problems with memory and information processing, which interferes with the child’s ability to learn in the classroom. It is for this reason that a child is not to return to school until medically cleared to do so.



# Management guidelines for suspected concussion



**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. The unconscious player must not be moved by anyone other than a medical professional or ambulance officer. 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 include:

1. **Recognising a suspected concussion.**
2. **Removing the player from the game.**
3. **Referring the player to a medical doctor for assessment.**

## Recognising a suspected concussion

- › Visible clues of suspected concussion

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

- › Loss of consciousness or responsiveness
  - › Lying motionless on ground/slow to get up
  - › Vomiting
  - › Seizure or convulsion
  - › Unsteady on feet/balance problems or falling over/incoordination
  - › Grabbing/clutching of head
  - › Dazed, blank or vacant look
  - › Confused/not aware of plays or events
  - › Facial injury
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- › Loss of consciousness, confusion and memory disturbance are all classical features of concussion. The problem

with relying on these features to identify a suspected concussion is that they are not present in every case.

**Symptoms reported by the player that should raise suspicion of concussion include:**

- › Headache
  - › Nausea or feel like vomiting
  - › Blurred vision
  - › Balance problems or dizziness
  - › Feeling “dinged” or “dazed”
  - › “Don’t feel right”
  - › Sensitivity to light or noise,
  - › More emotional or irritable than usual
  - › Sadness, nervous/anxious
  - › Neck pain
  - › Feeling slowed down, feeling like in a fog
  - › Difficulty concentrating or difficulty remembering
- 
- › Tools such as the CRT5 (see page 14) should be used to help identify a suspected concussion.
  - › It is important to note, however, that brief sideline evaluation tools (such as the CRT5), are designed to help identify a suspected 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.

- › Currently no commercially available tools (impact sensors, balance apps, etc) can be relied upon to either diagnose or exclude a concussion.
- › A pre-game checklist should be printed and provided to trainers and other staff involved in the match-day care of players. The checklist should be kept with the Concussion Recognition Tool 5th Edition (CRT5). The checklist should include contact details for:

**a) Local general practices;**

**b) Local hospital emergency departments; and**

**c) Ambulance services (000).**

- › 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.

## Removing the player from the game

- › **The basic rules of first aid should be used when dealing with any player who is unconscious or injured.**
- › Immobilisation of the neck in a cervical collar by a qualified first aid provider may be required. An appropriate sized collar should be available at every game.
- › Removing the conscious player from the game allows the first aid provider time and space to assess the player properly. Assessment should take place in a distraction-free environment, such as the change rooms.

- › Any conscious player with a suspected concussion must be **removed from the game and not be allowed to return to play in the same game or training session**. Do not be swayed by the opinion of the player, trainers, coaching staff, parents or others suggesting premature return to play. (See section below right for management of the unconscious player).

## 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 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 transferred to a local general practitioner or hospital emergency department.
- › It is useful to have a list of local doctors and emergency departments near the ground at which the game or training session is taking place. This resource can be determined at the start of each season (in discussion with the local medical services).

## Management of an unconscious player and when to refer to hospital

Basic first aid rules should be used when dealing with any unconscious player (i.e. danger, response, airway, breathing, circulation).

Care must be taken with the player's neck, which may have also been injured in the collision.

- › In unconscious players, the player must only be moved (on to the stretcher) by qualified health professionals, trained in spinal immobilisation techniques.
- › If no qualified health professional is on site, then do not move the player – await arrival of the ambulance.
- › If the unconscious player is wearing a helmet, do not remove the helmet, unless trained to do so.

- › Urgent hospital referral is necessary if there is any concern regarding the risk of a structural head or neck injury.
- › Overall, if there is any doubt, an ambulance should be called and the player referred to hospital.

### Urgent transfer to hospital is required in a player with any of the following:

- › Neck pain or tenderness
- › Double vision
- › Weakness or tingling/burning in the arms or legs
- › Severe or increasing headache
- › Seizure or convulsions
- › Loss of consciousness
- › Deteriorating conscious state
- › Vomiting
- › Increasing restlessness, agitation or combative behaviour

## B. Follow-up management

- › **Any concussed player must not be allowed to return to school or return to sport before having a medical clearance.**
- › **In children, return to learn and school should take precedence over return to sport.**
- › In every case, the decision regarding the timing of return to training should be made by a medical doctor with experience in managing SRC.
- › 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**").

### Return to school

Concussion may impact on a child's ability to learn at school. This must be considered, and **medical clearance is required before the child may return to school.**

**It is reasonable for a child to miss a day or two of school after concussion, but extended absence from school is uncommon.**

The child's doctor should help them get back to school after a few days.

In some children, a graduated return to school program will need to be developed for the child. Additional management by a paediatric neuropsychologist may assist in more difficult cases.

The child will progress through the return to school program provided that there is no worsening of their concussion-related symptoms. If any particular activity worsens symptoms, the child will abstain from that activity until it no longer causes worsening of their concussion-related symptoms. Use of computers and internet should follow a similar graduated program, provided that it does not worsen concussion-related symptoms. This program should include communication between the parents, teachers and health professionals and will vary from child to child. The return to school program should consider:

- › Extra time to complete assignments/tests
- › Quiet room to complete assignments/tests
- › Avoidance of noisy areas such as cafeterias, assembly halls, sporting events, music class
- › Frequent breaks during class, homework, tests
- › No more than one exam/day
- › Shorter assignments
- › Repetition/memory cues
- › Use of peer helper/tutor
- › Reassurance from teachers that student will be supported through recovery through accommodations, workload reduction, alternate forms of testing
- › Later start times, half-days, only certain classes.



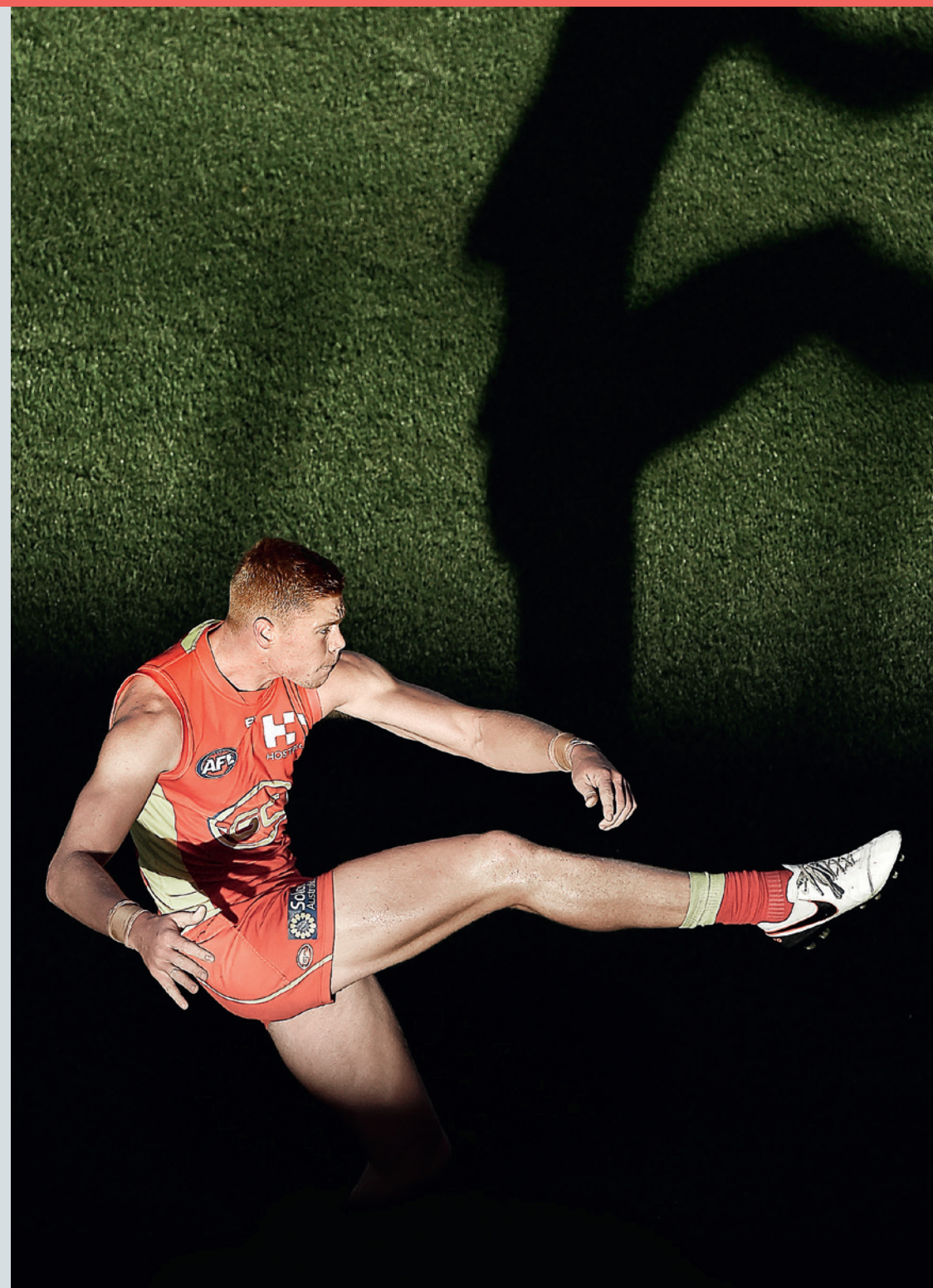
All schools are encouraged to have a concussion policy that includes education on SRC prevention and management for teachers, staff, students and parents, and should offer appropriate academic accommodations and support to students recovering from SRC.

The child is not to return to football, or other sport, until he/she has successfully returned to school/learning, is symptom-free, and has received medical clearance. However, early introduction of limited physical activity is appropriate, as long as symptoms do not worsen.

If there are any doubts, management should be referred to a qualified health practitioner, expert in the management of concussion in children.

### Return to play

- › Players should not return to football and other sports until their concussion-related symptoms have resolved and they have successfully returned to school/university/learning.
- › Players should be returned to football/sport in a graduated fashion.
- › When returning to play/sport, the player should follow a stepwise, medically managed exercise progression, with increasing amounts of exercise. For example:
  - › **Daily activities that do not provoke symptoms**
  - › **Light aerobic activity (e.g. walking, swimming or stationary cycling) - can be started 24-48 hours after symptoms have recovered**
  - › **Light, non-contact training drills (e.g. running, ball work)**
  - › **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)**
  - › **Full contact training - only after medical clearance**
  - › **Return to competition (game play)**
- › In this example, it would be typical to have 24 hours (or longer) for each step of the progression.
- › If any symptoms worsen while exercising, the player should go back to the previous step. Resistance training should be added only in the later stages.
- › If the player is symptomatic for more than 10-14 days (four weeks in children/adolescents), then review by a medical practitioner, expert in the management of SRC, is recommended.



# CONCUSSION RECOGNITION TOOL 5<sup>®</sup>

To help identify concussion in children, adolescents and adults



## RECOGNISE & REMOVE

Head impacts can be associated with serious and potentially fatal brain injuries. The Concussion Recognition Tool 5 (CRT5) is to be used for the identification of suspected concussion. It is not designed to diagnose concussion.

### STEP 1: RED FLAGS — CALL AN AMBULANCE

If there is concern after an injury, including whether ANY of the following signs are observed or complaints are reported, then the player should be safely and immediately removed from play/game/activity. If no licensed healthcare professional is available, call an ambulance for urgent medical assessment:

- Neck pain or tenderness
- Double vision
- Weakness or tingling/burning in arms or legs
- Severe or increasing headache
- Seizure or convulsion
- Loss of consciousness
- Deteriorating conscious state
- Vomiting
- Increasingly restless, agitated or combative

### Remember:

- In all cases, the basic principles of first aid (danger, response, airway, breathing, circulation) should be followed.
- Assessment for a spinal cord injury is critical.
- Do not attempt to move the player (other than required for airway support) unless trained to do so.
- Do not remove a helmet or any other equipment unless trained to do so safely.

If there are no Red Flags, identification of possible concussion should proceed to the following steps:

### STEP 2: OBSERVABLE SIGNS

Visual clues that suggest possible concussion include:

- Lying motionless on the playing surface
- Slow to get up after a direct or indirect hit to the head
- Disorientation or confusion, or inability to respond appropriately to questions
- Blank or vacant look
- Balance, gait difficulties, motor incoordination, stumbling, slow laboured movements
- Facial injury after head trauma



### STEP 3: SYMPTOMS

- Headache
- "Pressure in head"
- Balance problems
- Nausea or vomiting
- Drowsiness
- Dizziness
- Blurred vision
- Sensitivity to light
- Sensitivity to noise
- Fatigue or low energy
- "Don't feel right"
- More emotional
- More irritable
- Sadness
- Nervous or anxious
- Neck pain
- Difficulty concentrating
- Difficulty remembering
- Feeling slowed down
- Feeling like "in a fog"

### STEP 4: MEMORY ASSESSMENT (IN ATHLETES OLDER THAN 12 YEARS)

Failure to answer any of these questions (modified appropriately for each sport) 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?"

### Athletes with suspected concussion should:

- Not be left alone initially (at least for the first 1-2 hours).
- Not drink alcohol.
- Not use recreational/prescription drugs.
- Not be sent home by themselves. They need to be with a responsible adult.
- Not drive a motor vehicle until cleared to do so by a healthcare professional.

The CRT5 may be freely copied in its current form for distribution to individuals, teams, groups and organisations. Any revision and any reproduction in a digital form requires approval by the Concussion in Sport Group. It should not be altered in any way, rebranded or sold for commercial gain.

**ANY ATHLETE WITH A SUSPECTED CONCUSSION SHOULD BE IMMEDIATELY REMOVED FROM PRACTICE OR PLAY AND SHOULD NOT RETURN TO ACTIVITY UNTIL ASSESSED MEDICALLY, EVEN IF THE SYMPTOMS RESOLVE**

# Role of helmets & mouthguards in Australian Football

## Helmets

There is no definitive scientific evidence that helmets prevent concussion or other brain injuries in Australian Football.

Helmets may have a role in the protection of players on return to play following specific injuries (e.g. face or skull fractures).

Overall, however there is insufficient scientific evidence to make a recommendation for the use of helmets for the prevention of concussion in Australian Football.

## Mouthguards

Mouthguards have a definite role in preventing injuries to the teeth and face and for this reason they are **strongly recommended** at all levels of football. Mouthguards should be worn for all games and training sessions.

Dentally-fitted laminated mouthguards offer the best protection. 'Boil and bite' type mouthguards are not recommended for any level of play as they can dislodge during play and block the airway.

There is some preliminary scientific evidence that mouthguards may prevent concussion or other brain injuries in Australian Football.<sup>(3)</sup>

## References

1. McCrory P, Meeuwisse W, Dvorak J, et al. Consensus statement on concussion in sport-the 5th international conference on concussion in sport held in Berlin, October 2016. Br J Sports Med 2017 doi: 10.1136/bjsports-2017-097699
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3. Emery CA, Black AM, Kolstad A, et al. What strategies can be used to effectively reduce the risk of concussion in sport? Br J Sports Med 2017 doi:10.1136/bjsports-2016-097452.





Australian Football League  
AFL House  
140 Harbour Esplanade  
Docklands VIC 3008  
GPO Box 1449  
Melbourne VIC 3001  
visit [afl.com.au](http://afl.com.au)