

# HEAD INJURY



# Dr Bill McKay MBBS, MRCGP, FRACGP

Rugby CV is that of a Tragic...a very slow fullback

1975-80	SIC 13E, 14F, 15G, 16G, 9th XV, 5th XV
1977-80	SIC Referee
1979	SIC Linesman 2nd XV
1980	SIC Linesman 1st XV
1981-82	Warrane College at UNSW 2nd XV
1982	UNSW RUFC 4th XV (1 match)
1981-84	Medical year group XV (1st Yr '81, 2nd Yr '82, 3rd Yr '83, 4th Yr '84) (inter-faculty and v Sydney Uni Medicine)

1995-98 Wanderers' RUFC, Newcastle 4th XV (52 Matches)

1999 Wanderers' RUFC, Newcastle "Legend's XV"

1998 Wanderers' RUFC, Newcastle Manager 2nd XV

1999 Wanderers' RUFC, Newcastle Manager 3rd XV

2006-07 Basingstoke RUFC (Hampshire UK) Coach Under 7's

2007-08 Basingstoke RUFC (Hampshire UK) Coach Under 8's

2006-08 RFU Minis' Referee

# Professionally.....

1987	Graduated UNSW
1987-88	Royal Canberra Hospital
1989-90	Royal Prince Alfred Hospital
1991-92	Rural Registrar Western NSW
1992-94	Anaesthetics and Intensive Care
1995-2007	Emergency Medicine in Australia and UK.
2008	General Practice

# Brain Injury Cause

Hypoxic Brain Injury: Drowning, Cardiac Arrest, Choking

Vascular Accident: Haemorrhage: Subarachnoid, Intra-cerebral  
Thrombotic

Metabolic: Hypoglycaemia, Hypothyroidism

Infection: Encephalitis, Meningitis

Toxic: Alcohol, Lead, Mercury

Penetrating Trauma: Gunshot, Spear gun, Axe, Metal Poles

Blunt Force Trauma

## Epidural Haemorrhage (Extradural haemorrhage)

Occurs between the dura mater and the skull.

It results from laceration of an artery, most commonly the middle meningeal artery due to a fracture of the Temporal bone.

A very dangerous type of injury because the bleed is at arterial pressure and causes a deadly, rapid increase in ICP.

It is the least common haemorrhage.

Patients may have a loss of consciousness (LOC), then a lucid interval then sudden deterioration (vomiting, restlessness, LOC)

Head CT shows lenticular (convex) deformity.



# Subdural Haematoma

Occurs due to tearing of the bridging veins in the subdural space between the dura mater and arachnoid mater.

A low pressure bleed.

Classically in older patients

Delayed symptoms

Head CT shows crescent-shaped deformity





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## Cerebral contusion

Cerebral contusion is bruising of the brain tissue.

The majority of contusions occur in the frontal and temporal lobes.

Complications may include cerebral oedema and transtentorial herniation.

The goal of treatment should be to treat the increased intracranial pressure.

The prognosis is guarded.

## Diffuse axonal injury

Occurs as the result of an acceleration / deceleration motion.

Not necessarily an impact.

Axons are stretched and damaged when parts of the brain of differing density slide over one another.

Prognoses vary widely depending on the extent of damage.

# Concussion

(Mild Traumatic Brain Injury)



## What is concussion?

Concussion is a complex process caused by trauma that transmits force to the brain, either directly or indirectly, and results in temporary impairment of brain function.

Its development and resolution are rapid and spontaneous.

A Player can sustain a concussion without losing consciousness.

Concussion is associated with a graded set of clinical signs and symptoms that resolve sequentially.

Concussion reflects a functional rather than structural injury and standard neuro-imaging is typically normal.

**CONCUSSION  
MUST BE  
TAKEN  
EXTREMELY  
SERIOUSLY.**

# SIGNS AND SYMPTOMS OF CONCUSSION

## Symptoms

Headache, “dizziness”, “feeling in a fog”, sleepy

## Physical signs

Loss of consciousness, vacant expression, vomiting, inappropriate playing behaviour, unsteady on legs, slowed reactions

## Behavioural changes

Inappropriate emotions, irritability, anxiety, nervousness

## Cognitive impairment

Slowed reaction times, confusion/ disorientation, poor attention and concentration, Amnesia (pre & post).

## Sleep disturbance

Drowsiness

Being unaware of what happened, even for a few moments at the time of the injury is a common sign that the player is or has been concussed.

A player showing any of these signs or symptoms should be removed from the field and referred for medical attention.

Prolonged loss of consciousness as a result of a blow to the head may be indicative of a more serious injury, so the player should be immediately referred to a hospital for further attention.



## Concussion Grading:

Numerous systems have been proposed by various organisations

For example: the guidelines devised in 1997 by the American Academy of Neurology

Grade I: No loss of consciousness and symptoms of confusion last less than 15 minutes.

Grade II: No loss of consciousness but symptoms last longer than 15 minutes.

Grade IIIa: Loss of consciousness does occur (Seconds).

Grade IIIb: Loss of consciousness does occur (Minutes)

According to the AAN, permanent brain injury can occur with either Grade II or Grade III concussion.

## CONCUSSION MANAGEMENT PRINCIPLES

1. Concussion must be taken extremely seriously to safeguard the long term welfare of Players.
2. Players suspected of having concussion must be removed from play and must not resume play in the match or training.
3. Players suspected of having concussion must be medically assessed.
4. Players suspected of having concussion or diagnosed with concussion must go through a graduated return to play protocol (GRTP).
5. Players must receive medical clearance before returning to play.

# **WARNING:**

**Complications, potentially serious, may occur in the 24 hours after a seemingly slight head injury.**

**Accordingly, deterioration of consciousness after apparent recovery or the onset of symptoms such as headaches, increasing drowsiness, blurred vision and vomiting, require immediate medical assessment.**

# IF THE PLAYER IS UNCONSCIOUS ?



# IF THE PLAYER IS UNCONSCIOUS

*Always suspect an associated neck injury.*

If respiratory arrest occurs, Cardio Pulmonary Resuscitation (CPR) should be commenced.

CALL “OOO” FOR AN AMBULANCE.

Once conscious, determine the manner in which the injury happened and if there is tingling in upper or lower limbs and if any power loss is present.

If there is no one experienced in the management of cervical spine injury.....

the **PLAYER SHOULD NOT BE MOVED** but given emotional support while awaiting the ambulance.

Ensure the player is sufficiently warm.

## **You've Hit Your Head! -** *You may have a CONCUSSION*

You may experience headache, dizziness, blurred vision, amnesia (memory loss), difficulty concentrating, irritability, “drunk” feeling. This could resolve in hours or weeks.

### **For the next 6 hours, please:**

Stay with someone.

Do not drink.

Do not drive.

Do not take pain relief.

Do not sleep.

Please rest quietly.

No TV / reading / games / texting.

**If you:**

Have pain that progressively gets worse,

Vomit,

Have a fit,

Are worried... **GO TO HOSPITAL.**

**While you have any symptoms you cannot exercise.**

When you are symptom free, do some light cardio. If you are still symptom free, you can do some resistance training.

If you are still symptom free, you can go to footy training.

If you get through footy training symptom free, you can play.

(Fergus Tilt: “Fit as a Physio”, Mosman & MRUFC)



## Return to Play

The decision about when a player can safely return to play must be made by a doctor.

The doctor decides on a case-by-case basis.

Things that help the doctor decide when the player can return to play include:

The symptoms the player has.

The player's medical history.

The player's concussion history.

The player's medicine use.

The type of sport and the position played.

The player's ability to stand and keep his or her balance.

The player's ability to pay attention and to answer questions that test learning and memory.

How quickly the player can solve problems.

A player must not return to play until symptoms are completely gone, both at rest and during exercise or exertion.

Children and teenagers have longer recovery times. They may have to wait longer before they can return to play.

The first treatment for a concussion is rest, both physical and mental.

When symptoms are completely gone, the player may begin light aerobic exercise, such as walking.

The return to play needs to continue in a gradual, step-by-step process.

If one or more symptoms return, the player needs to go back to a level of activity with no symptoms for at least 24 hours before trying to do more.

A doctor must always make the final decision about whether a player is ready to return to full-contact play.

These general rules apply to return to play after a first concussion.

After more than one concussion, the player will most likely need a longer recovery time.

Because the risk for a second concussion is greatest within 10 days of the first concussion, it's very important to make sure the player is completely recovered before he or she returns to play.

A second injury, even if it is not a head injury, could cause permanent brain damage or death.

## Second Impact Syndrome.

First described by Saunders and Harbaugh in 1984.  
The second impact in catastrophic contact-sports head trauma. JAMA. 1984;252:538–539.

Occurs when a second concussion is sustained before complete recovery from a previous concussion that causes vascular congestion and increased intracranial pressure, which may be difficult or impossible to control.

Usually fatal.

The risk for catastrophic effects from successive seemingly mild concussions sustained within a short period is not yet widely recognized.

## Case 1:

October 1991, a 17-yo high school football tackled and struck his head on the ground.

At half-time, he told a teammate that he felt ill and had a headache.

He did not tell his coach.

He played again during the third quarter and received several routine blows to his helmet during blocks and tackles.

He then collapsed on the field and was taken to a local hospital in a coma.

A computerized tomography (CT-Scan) brain scan revealed diffuse swelling of the brain and a small subdural hematoma.

He was pronounced dead 4 days later

## Case 2:

August 1993, a 19-year-old college football player reported headache to family members after a full contact-practice during summer training.

At practice the following day he collapsed on the field approximately 2 minutes after engaging in a tackle.

He was transported to a nearby trauma centre where a CT scan of the head showed diffuse brain swelling and a thin subdural hematoma.

He was pronounced brain dead 3 days later.



# “Footballers’ Migraine”



# “Footballers’ Migraine”

Prof Walter Bryan Matthews (1920 – 2001)

A term used in 1972 to describe recurrent headaches in English footballers caused by ‘heading’ the football.

The medical term is Post-Concussion Syndrome

## Post-Concussion Syndrome

A complex disorder in which a variable combination of post-concussion symptoms — such as headaches, poor memory, dizziness, tiredness, nausea and depression — last for weeks and sometimes months after the injury that caused the concussion.

The risk of post-concussion syndrome doesn't appear to be associated with the severity of the initial injury.

In most people, Post-Concussion Syndrome symptoms occur within the first seven to ten days and go away within three months, though they can persist for a year or more.

Post-concussion syndrome treatments are aimed at easing specific symptoms.

# Chronic Traumatic Encephalopathy

A progressive degenerative disease, in individuals with a history of multiple concussions.

Patients with CTE may show symptoms of memory loss, aggression, confusion and depression, which may appear within months of the trauma or many decades later.

CTE has been most commonly found in professional American footballers, ice hockey players and other contact sports players.

It has been found in Military personnel exposed to a blast and/or a concussive injury.

## Dementia Pugilistica

A neurodegenerative disease or dementia that may affect amateur or professional boxers as well as athletes in other sports who suffer concussions.

A variant of Chronic Traumatic Encephalopathy.

Symptoms and signs of DP develop progressively over a long latent period sometimes amounting to decades, with the average time of onset being about 12 to 16 years after the start of a career in boxing.

The condition is thought to affect around 15% to 20% of professional boxers.

The condition is caused by repeated concussive and sub-concussive blows (blows that are below the threshold of force necessary to cause concussion), or both.

## Sources:

Centers for Disease Control and Prevention, Dept. of Health and Human Services, USA. 1997

“Concussion (Mild Traumatic Brain Injury) and the Team Physician: A Consensus Statement – 2011 Update”

America College of Sports Medicine October 2011 (pp2412-2422)

“Summary and agreement statement of the 2<sup>nd</sup> International Conference on Concussion in Sport, Prague 2004”

British Journal of Sports Medicine 2005; 39:196-204

## Guidelines

The IRB Concussion Guidelines are available at:

[www.irbplayerwelfare.com](http://www.irbplayerwelfare.com).

More information on concussion management, graduated return to play, and concussion factsheets are available at:

[www.tryrugby.com.au/policies](http://www.tryrugby.com.au/policies).