

Head injury: Knowing the symptoms and risks

Delivering appropriate first aid for head injuries can be difficult and it is essential that staff members are adequately trained to assess and manage these, Emma Hammett explains why and provides a useful overview of some of the more common symptoms and risks.

Head injuries are particularly difficult first aid emergencies to manage as the initial injury may well appear superficial and more serious effects can take longer to manifest themselves. It is also extremely common for children to knock their heads and important for the person administering the first aid to be able to quickly establish the severity of the injury and decide whether it is necessary to keep them still and phone an ambulance, or help them get up and keep an eye on them.

Concussion

A concussion is a brain injury that is characterised by an onset of impairment of cognitive and/or physical functioning, and is caused by a blow to the head, face or neck, or a blow to the body that causes a sudden jarring of the head (e.g. a helmet to the head, being knocked to the ground). A concussion can occur with or without a loss of consciousness, and proper management is essential to the immediate safety and long-term future of the injured individual. A concussion can be difficult to diagnose, and failing to recognise the signs and symptoms in a timely fashion can have dire consequences. The effects of repeated concussions can be cumulative, and after a concussion, there is a period in which the brain is particularly vulnerable to further injury. If someone sustains a second concussion during this period, the risk of permanent brain injury increases significantly and the consequences of a seemingly mild second concussion can



'Repeated injury further damages the brain and so it is vitally important that sport players do not play on following a blow to the head and always take time out from play and training to allow for their injury to fully recover.'

be very severe, and even result in death (i.e. 'second impact syndrome').

Most people who experience a concussion have no long-lasting effects, as long as the first injury has sufficient time to recover; for example, if they are athletes they must rest sufficiently and not return to play sports too soon.

Will Smith starred in the film *Concussion* earlier this year about the battle Dr Omalu had with the National Football League (NFL American Football) to take concussion more seriously and care more about the safety of their players. As a result of Dr Omalu's research and

persistence, the NFL not only takes better care of its players but has also organised a \$1 billion pay-out to former players (Stempel and Ax, 2016). In addition, it funds much concussion-related research and contributed to the major 'Concussion in Sport' project to study the long-term effects of head injuries, currently led in Britain by Dr Michael Turner.

Traumatic brain injury

Traumatic brain injury occurs following a head injury, as a result of a blow or jolt to the head, and can result in permanent or temporary damage to the brain. It is the

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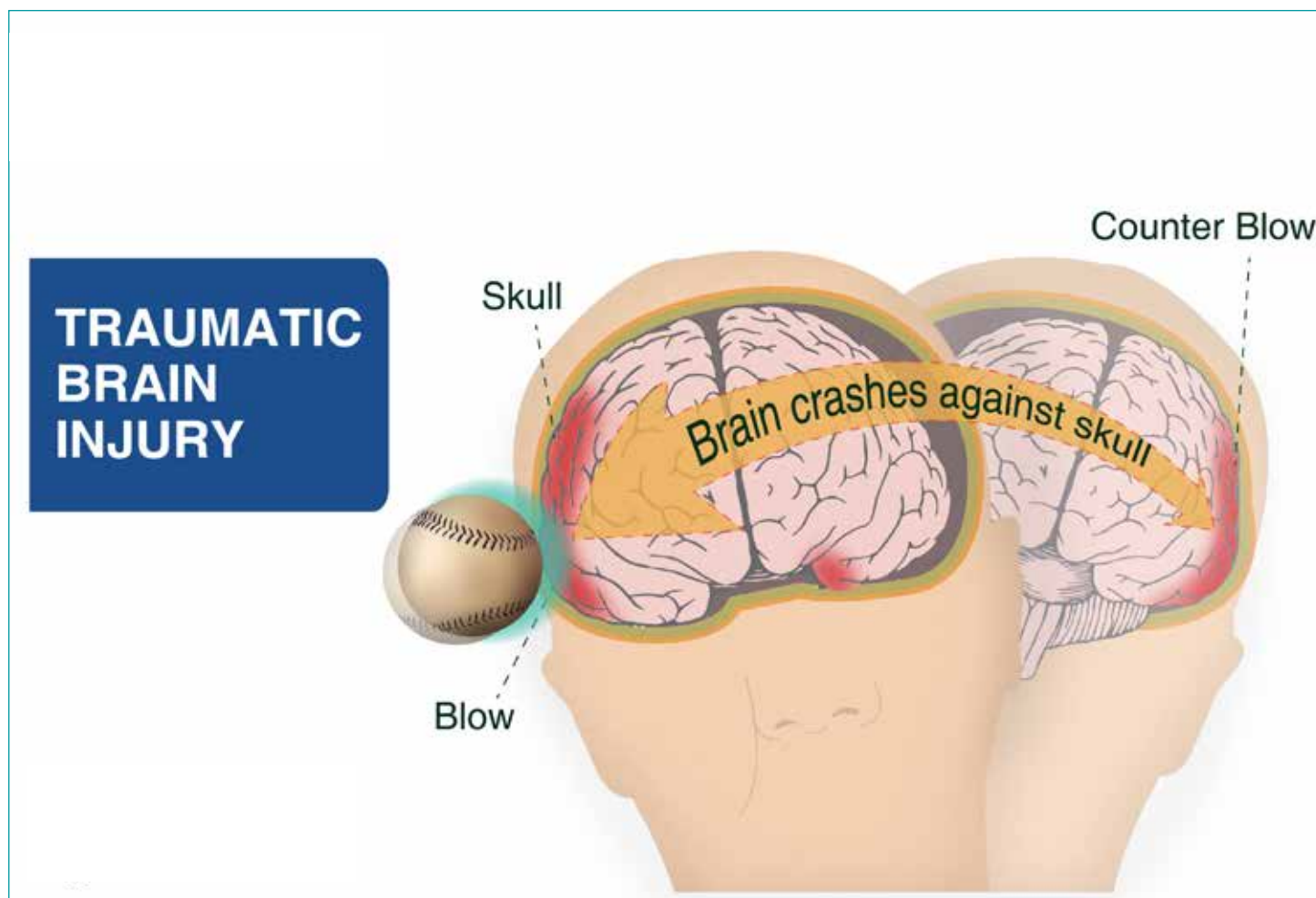


Figure 1. During impact to the head, the soft brain crashes back and forth against the inside of the hard skull causing bruising, bleeding, and shearing of the brain

leading cause of disability and death in people under 45 years of age. A traumatic brain injury can cause the signs and symptoms of concussion.

The injury that occurs initially, at the moment of impact is known as the primary injury and this can either affect a small part or specific lobe of the brain or can damage the whole brain.

However, during the impact, the brain can smash against the inside of the skull, tearing nerve fibres and causing bruising and bleeding to the brain (Figure 1).

Compression or secondary brain injury

It is possible that immediately after an accident, the casualty might appear confused, may briefly be unconscious, have blurred vision or feel a bit sick. These are the signs and symptoms of concussion.

They may initially recover and appear fine; however, they may swiftly deteriorate. The problem occurs as a

result of delayed trauma, or a secondary brain injury or compression (Figure 2), and this can cause more damage than the primary injury. Repeated injury further

damages the brain and so it is vitally important that sports players do not play on following a blow to the head and always take time out from play

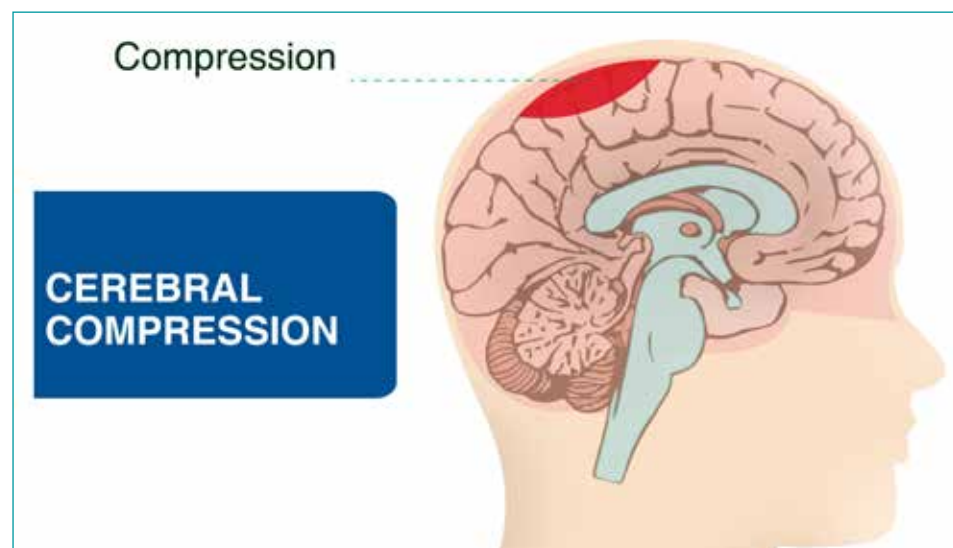


Figure 2. Cerebral compression

Table 1. Signs and symptoms to look out for following a head injury

Please note: The following signs and symptoms can appear immediately or over the next couple of days. Keep a close eye on the casualty and get medical advice if at all concerned.

Observed by others	Experienced by the casualty
■ Appears stunned and dazed ■ Loses consciousness (even briefly) ■ Is confused about events ■ Trouble thinking or concentrating ■ Can't recall events prior or after event ■ Shows behavioural or personality changes ■ Answers questions slowly and repeats questions ■ Shows behaviour or personality changes	■ Headache or pressure in the head ■ Balance problems or dizziness ■ Nausea/vomiting ■ Sensitivity to light or noise ■ Does not feel right ■ Blurred vision or double vision ■ Feel 'dazed', sluggish, foggy or groggy ■ Difficulty concentrating or remembering ■ feeling irritable, sad, nervous or more emotional ■ Sleep disturbances

Sources: This table is based on two First Aid for Life head injury posters

and training to allow for their injury to fully recover. The Football Association (2015) and England Rugby (2016) have

produced guidelines for players suffering head injuries (see *Further information*). Compression is a secondary response

to a major head injury and occurs as the brain swells. Swelling is a perfectly normal and usually helpful response to injury and occurs as extra oxygenated blood, fluid and nutrients are brought to the injured area. However, the problem with swelling within the brain is that the skull forms a rigid box, resulting in increasing pressure on the brain which can constrict and damage other areas of the brain that were not damaged in the initial impact. This swelling can happen immediately or anytime up to 5 days after the injury (and even later if followed by a further head injury before the original injury has fully recovered).

What are the symptoms of concussion?

Depending on the type and location of the injury, the person's symptoms may include:

- Loss of consciousness
- Confusion and disorientation
- Memory loss/amnesia
- Fatigue and tiredness
- Headaches
- Visual problems
- Poor attention/concentration
- Sleep disturbances
- Dizziness/loss of balance
- Irritability/emotional disturbances
- Feelings of depression
- Seizures
- Vomiting.

A useful pocket guide to recognising concussion has been developed by the *British Journal of Sports Medicine* and can be accessed here: <http://bjsm.bmj.com/content/47/5/267.full.pdf>

First aid for a head injury

- Maintain both your safety and that of the casualty
- Bear in mind that if they have suffered a serious head injury it is likely they may have sustained a spinal injury as well. Their airway remains your priority; however, if you need to roll them into the recovery position try to do so without twisting their spine.
- Quickly assess if there are any immediate life threatening injuries—check for a response and see if they are breathing normally. (if unconscious and breathing carefully put into the recovery position, while doing your best to keep their spine in line (log rolling them if possible)—keep checking that they are breathing; if

Further information

First Aid for Life

First Aid for Life is a training provider and offers a number of free resources, including free posters, an emergency check list and advice on what to include in first aid kits available at: firstaidforlife.org.uk 0208 675 4036

Posters on concussion and head injury symptoms are available on request, email: emma@firstaidforlife.org.uk

Headway

Headway is a UK-wide charity that works to improve life after brain injury. It provides support, services and information to brain injury survivors, their families and carers, as well as to professionals in the health and legal fields.

Guidance

British Journal of Sports Medicine (2013) *Pocket concussion recognition tool To help identify concussion in children, youth and adults*. <http://bjsm.bmj.com/content/47/5/267.full.pdf>

England Rugby (2016) What is concussion? http://www.englandrugby.com/mm/Document/General/General/01/31/43/25/1Overview_English.pdf

Headway (no date) Minor head injury discharge advice—Adults. <https://www.headway.org.uk/media/2814/minor-head-injury-discharge-advice.pdf>

The Football Association (2015) *The FA Concussion Guidelines*. <http://www.thefa.com/my-football/coach/concussion>

‘However, the problem with swelling within the brain is that the skull forms a rigid box, resulting in increasing pressure on the brain which can constrict and damage other areas of the brain that were not damaged in the initial impact. This swelling can happen immediately or anytime up to 5 days after the injury...’

staff members attend a first aid course to understand what to do in a medical emergency. **BJSN**

Conflict of interest: Emma Hammett is the founder of First Aid for Life.

The author provides this information for guidance and it is not in any way a substitute for medical advice.

Stempel J, Ax J (2016) NFL's \$1billion concussion settlement upheld as United States appeals court describe the payout as imperfect but fair. <http://www.dailymail.co.uk/sport/sportsnews/article-3546377/NFL-s-1billion-concussion-settlement-upheld-United-States-appeals-court-payout-imperfect-fair.html> (accessed 4 October 2016)

The Football Association (2015) The FA releases new guidelines for managing concussion. <http://www.thefa.com/news/my-football/2015/nov/fa-concussion-guidelines-if-in-doubt-sit-them-out> (accessed 4 October 2016)

England Rugby (2016) Concussion—Headcase. <http://www.englandrugby.com/my-rugby/players/player-health/concussion-headcase/overview/> (accessed 4 October 2016)

they are unconscious and not breathing start CPR)

- A wrapped ice pack can be helpful to reduce superficial bruising and swelling.
- Keep monitoring the casualty for at least the next 48 hours and ensure they are not left on their own for any prolonged length of time. Let others know that they have had a head injury. Observe for any of the above symptoms and if concerned call an ambulance.

■ Someone suffering from compression must receive immediate medical treatment in hospital. They may be treated with rest, observation and medication, or may require surgery to relieve the pressure on the brain.

The Head Injury Charity Headway has excellent advice for people who have suffered a head injury (see *Further information*).

It is strongly advised that all school