

# TRAUMATIC brain injury

## How to read the signs

By Dr Stephen R Buckley

Less severe traumatic brain injury frequently accompanies other serious injuries sustained in industrial or motor accidents, and is often not appreciated by medical carers or legal officers.



**T**he Motor Accident Authority (MAA) Guidelines identify traumatic brain injury (TBI) as having occurred, to an assessable extent, if both of the following criteria are met:

1. evidence of:
  - a. a significant impact to the head; or
  - b. a cerebral insult; or
  - c. a high velocity vehicle impact accident; and
2. one or more significant medically verified abnormalities, such as:
  - a. an abnormal initial post-injury Glasgow Coma Scale Score; or
  - b. post-traumatic amnesia; or
  - c. brain imaging abnormality.

These criteria are frequently met in serious motor vehicle accidents but, if the head injury is not life-threatening, apart from initial interest demonstrated in emergency departments, the possibility of TBI is often overlooked – particularly if the care is provided in orthopaedic or outlying wards.

Patients in this category often have multiple and even life-threatening orthopaedic, chest or abdominal injuries, whereas their head injury is not life-threatening.

Nevertheless, after the other – apparently more serious – injuries have healed, the ongoing deficits of brain impairment often cause the most serious long-term problems for the victim. Difficulties with return to work, family relationships and financial affairs are regularly the outcome of this level of traumatic brain injury.

### THE SIGNIFICANCE OF TBI

The effects of TBI are all-pervasive for several reasons. The first is that TBI occurs when brain cells or their connections are broken or destroyed. While many research dollars are being spent in an attempt to improve recovery following such an incident, brain cells do not regrow; nor are they replaced; nor are their connections re-established following significant trauma. So TBI is a permanent outcome, just like the amputation of a finger, arm or leg.

If a head injury of sufficient force to cause the death of brain cells has occurred, other brain cells will also be damaged but not destroyed. These damaged cells can be expected to recover. Thus, the worst effects can be identified in the days immediately following the brain injury, and recovery and improvement will occur, initially at a rapid rate, for up to two years. After this time, the damage stabilises in terms of any cognitive impairment caused by the brain injury.

As the brain's widespread neural networks are required for learning, a significant deficit for brain-injured people is impairment of learning: the brain-damaged person does not 'learn from their mistakes', and goes on making the same mistakes over and over again. This causes an inevitable rise in stress levels within the family, and is frequently the cause of marital and other relationship failure.

In addition, because the frontal lobes are often damaged in cases of TBI, the person's personality can change.

'Personality' describes the way a person reacts to his or her environment. While animals react instinctively, human >>



beings test possible courses of action by 'thinking through' their reactions, using their frontal lobes (which are more or less absent in the animal kingdom).

In TBI cases, the 'thinking through' process is short-circuited, causing impulsivity and instinctive reactions to the environment, such as loss of temper. Other frontal lobe functions – foresight, insight, planning and motivation – are also regularly affected.

Nevertheless, the final outcome of TBI is extremely difficult to predict in the early stages, and is highly variable. In some cases, people with apparently very serious injuries (with prolonged post-traumatic amnesia) make a complete or nearly complete recovery and are capable of returning to an independent lifestyle. More commonly, however, people with prolonged post-traumatic amnesia are severely affected and require ongoing support and assistance.

In the future, in NSW, the new 'Lifetime Care and Support Scheme' may cover some of the more serious cases of TBI. However, legal advisers should remain alert to the possibility of a brain injury that has been missed because of a shorter period of post-traumatic amnesia, and where the effects are behavioural abnormalities rather than cognitive difficulties.

#### WHAT SHOULD THE LAWYER LOOK FOR?

Several historical indicators should heighten suspicion that TBI has occurred.

##### No memory of the accident

The first is the likelihood that the victim will not recall the accident.

Often, victims remember that an accident was about to happen, but do not recall the 'crash'. The victim's next memories may then be the immediate post-accident circumstances including, for example, a passer-by coming to the window of the car, the airbags and 'smoke' in the cabin, or similar recollections. In my experience, this type of history is common and is rarely associated with significant TBI.

On the other hand, the person who remembers entering the intersection, and whose next memory is much later – for example, in hospital – may well have suffered TBI.

##### Impaired level of consciousness

Review of the ambulance officers' notes (ambulance report) often identifies an altered Glasgow Coma Scale Score. Sometimes the Glasgow Coma Score is normal (15/15), but the description written by the officer shows that the victim was 'confused', or provides evidence of altered cognition. This regularly occurs because of inaccuracies in using the Glasgow Coma Scale. In my opinion, this is the same as having an altered Glasgow Coma Scale Score.

##### Post-traumatic amnesia

Post-traumatic amnesia (PTA) refers to the time during which a damaged brain is so severely affected that it cannot record continuous memory. During this period, memories are not saved to the brain's 'hard disk', and are quickly lost. Initially, people appear confused, but later detailed testing is required

to identify the fact that recollection from the day before is failing.

Some hospitals now routinely measure PTA in patients involved in serious accidents. Many do not. Detailed examination of the hospital record can sometimes identify PTA, particularly when a normally even-tempered person is identified as 'obnoxious' or difficult to deal with in the ward.

Such an analysis is probably best left to medical review, but if a usually even-tempered person is behaving badly in the days following their accident, it should alert their legal adviser to the possibility of TBI.

##### Personality change

Another red flag suggesting TBI can be the disintegration of a previously stable life following a serious accident.

A person with TBI may tend to blame physical deficits for their failings. But when a return to work fails, relationships are in trouble, financial mistakes are made, and a formerly even-tempered person is involved in arguments and fights, one might well suspect the presence of brain injury.

Regularly, in my experience, this type of problem is blamed on pain resulting from orthopaedic injuries, or depression, but such complaints are out of proportion to the expected complaints for that type of injury. This lack of proportion may be attributable to TBI.

##### WHAT TO DO

If TBI is suspected, it is wise to assemble a full portfolio of evidence before obtaining a MAA medical assessment. The medical assessor can comment on the likelihood of brain injury only if all the evidence is available.

Assembling the evidence is, in my experience, a complex matter. Comparative assessment of the ambulance report, emergency department notes, full hospital notes and neuropsychological evidence, requires considerable experience in the management of TBI patients.

Note that depressed levels of consciousness can be caused by medication, rather than brain injury, and pre-existing behavioural patterns or other issues can also interfere with the accuracy of the assessment.

##### SUMMARY

Missed TBI in the less severe range frequently accompanies other severe injuries.

Where the brain injury is not life-threatening, action is often not taken to assist the victim once other injuries have resolved. Nevertheless, such a brain injury can ruin lives, and in cases where a person does not recall the accident or its immediate aftermath, or where difficulty is experienced at work or at home, or in relation to behavioural abnormality, the possibility of TBI should be considered. Careful documentation of all the circumstances will often provide ample evidence of the existence of a brain injury. ■

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