

BRAIN INJURY

due to assault



THE FACTS

By looking at trends in hospitalisations (1999-2011) due to assaults we can get some insights into the prevalence of brain injury due to assault (AIHW, 2013): In Australia:



- In just one year, 13,548 persons presented to hospital following assault by bodily force (2010-2011)
- 45% of assault cases were males between the ages 25-44, and 33% between ages 15-24
- 151 cases resulted in death, as recorded 2002 - 2005.
- 55% of deaths were caused by "Assault by bodily force", and 25% "Assault with blunt/sharp object"
- body regions more commonly identified were the head (50%) and trunk (41%),
- brain injuries (40%) and internal organ damage (22%) were the most common complications

Trends in hospitalisations can also lend insights into the percentages of traumatic brain injury (TBI) due to assault (Helps, Henley, Harrison, 2008):

- 14.5% of all brain injuries were due to assault
- Australia wide, this totals > 3000 cases of TBI due to assault annually
- Ration of male: female victims was 5:1.
- Average length of hospital stay is 3.4 days, totalling almost 7,000 hospital bed days used.

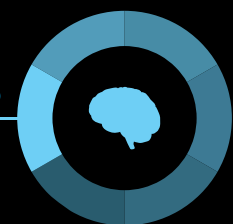


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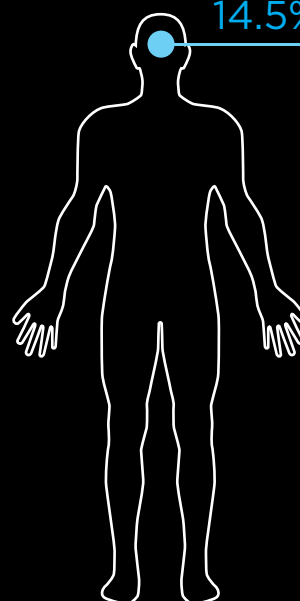
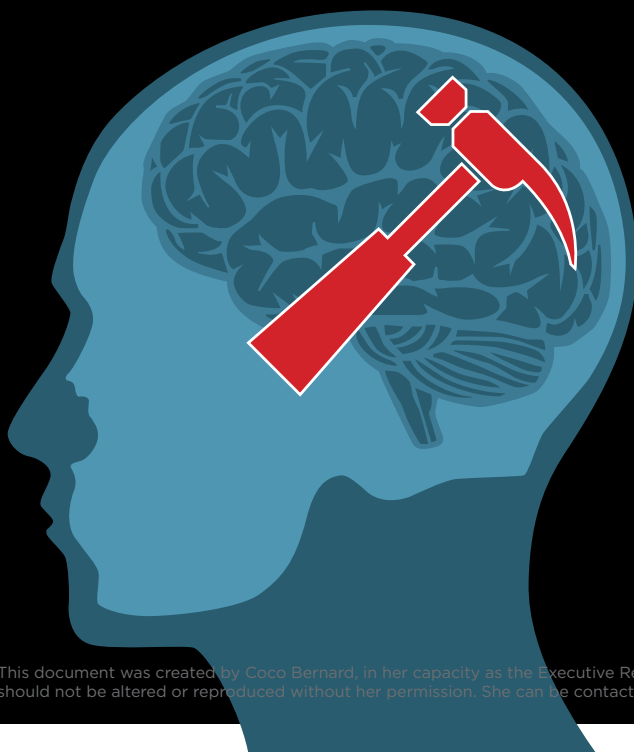
Comprehensive research (Olver, Ponsford & Curran, 1995; Ponsford, Sloan, & Snow, 2012; Ponsford, Draper & Schonberger 2008) has highlighted that of those with moderate-severe brain injuries:

- 65% don't return to pre-injury functioning
- 56% return to study
- 50% will not have returned to employment at 2 years post-injury
- 1 in 3 will require assistance with some basic community skills such as banking, shopping, and transport.
- 2 in 3 will suffer from psychological problems including depression, anxiety, and reduced self-esteem

14.5%



14.5% of all brain injuries were due to assault





So what is a “brain injury”?

There are many ways in which one can sustain a brain injury. It may be through excessive alcohol/drug use, loss of oxygen to the brain (hypoxia), infection, growth of a tumour, a stroke, or a traumatic event such as an accident.

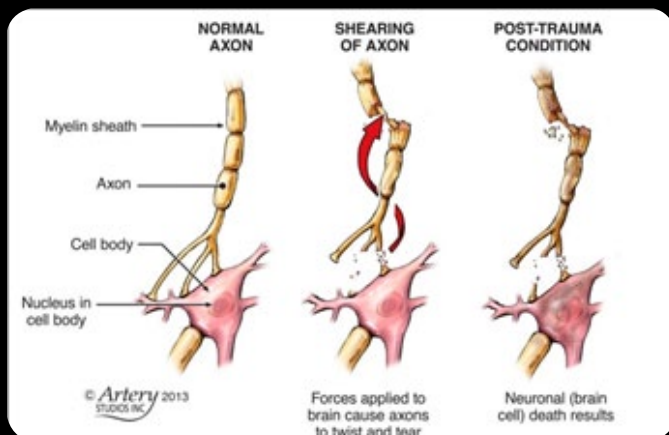
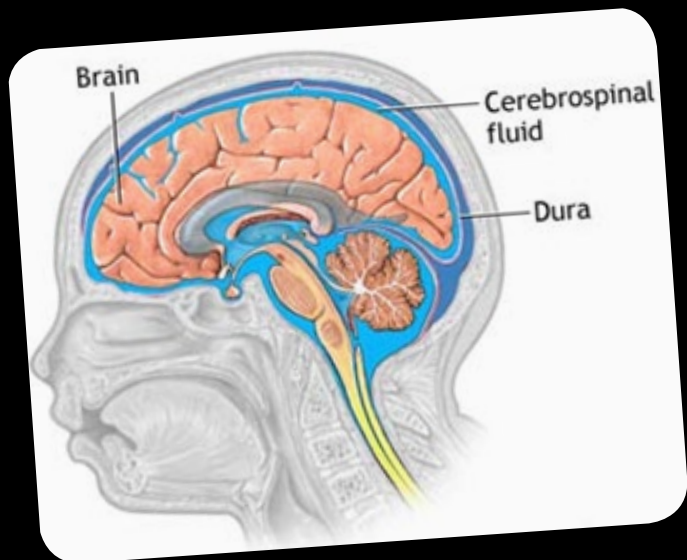
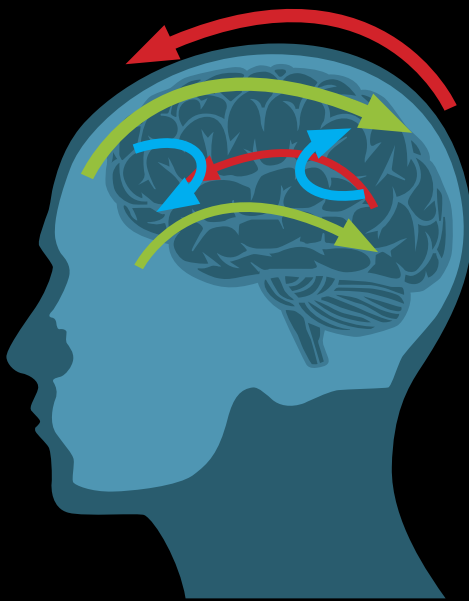
This last category of brain injuries are referred to as traumatic brain injuries (TBIs) which includes any accidents such as sporting accidents, car accidents, falls, and assaults.



What actually happens to our brain when we are punched and/or fall?

Whilst cuts and/or bruising to the scalp are the most visible, the worst and long-lasting damage is caused by the brain moving around inside the skull. As shown below (left), our brains sit in a bath of fluid called cerebral spinal fluid (CSF) which acts to protect the brain from natural movement (i.e. jumping around) and mild swelling. But our brains’ in-built protection only goes so far!

As shown in the image on the left below, when we are punched or knock our head on a hard surface, **the brain bounces forward (red arrows) and back (green arrows)** against our skull subjecting our brain to shearing forces. The brain can also be **subjected to rotational forces (blue arrows)** which cause the most damage.



What is actually damaged in the brain?

Our brain contains billions of neurons which carry messages around our brain and down the spinal cord to control our body.

The force from an assault/fall causes the neurons to shear or even sever completely (see image at right). This damage can have extreme ramifications on the neurons’ ability to communicate with one another.

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Consequences of brain injury

In many tragic instances the injuries sustained to the head from assault prove to be fatal, but the majority of those who survive will sustain a traumatic brain injury to some degree, with associated impairments and disability.

In some cases the brain injury will be relatively minor (e.g. a concussion) with minimal long-term consequences, but more severe brain injuries can result in significant ongoing disability and impinge on one's ability to work, or engage socially within the community (Ponsford, Draper, & Schonberger 2008). This can also be a significant burden on the individual's family, the healthcare system, and incur large costs in rehabilitation and other medical services.

The changes in someone after a brain injury can be physical, cognitive (i.e. thinking skills such as memory and concentration), behavioural, or a combination of all three (Ponsford, Sloan, & Snow, 2012; Ponsford, 2013). Examples include:

Motor and sensory impairments



- Weakness, paralysis
- Inco-ordination of muscle movements (ataxia), loss of fine and gross motor dexterity, poor balance, reduced physical endurance
- Changes in ability to smell, see, taste, and hear
- Changes in sensation to touch and temperature
- Damage to muscles that allow us to swallow and speak

Cognitive impairments



- Poor attention and focus (i.e. more easily distracted)
- Reduced speed of information processing (i.e. slower to complete tasks)
- Learning and memory difficulties
- Difficulties with language and communication (i.e. expressing oneself)
- Poor organisation skills (e.g. not knowing how to approach a task)
- Concrete thinking (e.g. not being able to see other's points of view)
- Impulsivity (doing or saying things without thinking it through first)
- Fatigue

Behavioural/mood problems



- Irritability, frustration and temper outbursts
- Lack of drive and motivation (e.g. planning things but never doing them)
- Engaging in socially inappropriate behaviour without realising
- Depression (e.g. reduced enjoyment in things, sadness, hopelessness)
- Anxiety (**e.g. constant worry about things**).

Family issues



- Families are usually left with long-term responsibility for practical, social, emotional needs
- Significant burden upon ageing parents
- Behavioural problems cause greatest stress for families
- Significant long-term effects upon siblings/children

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