

ESSAY: Traumatic Brain Injury

Traumatic Brain Injury (TBI) refers to brain injury acquired through a traumatic event, such as a traffic accident or a blow to the head from a sporting injury [1]. The severity of TBI can range from mild, moderate and severe and can result in impairment of brain function and cognition and/or behaviour but also the functions of one or more systems such as neurological, sensory, musculoskeletal. This is determined primarily from one of two methods, 1) Glasgow Coma Scale (GCS), which assesses eye opening, motor and verbal function, with lower scores indicating greater loss of consciousness and typically associated with a more severe TBI; or 2) duration of Post Traumatic Amnesia (PTA), which is period of time in which the brain is unable to retain continuous day-to-day memory [1].

Table: Definitions for classifying TBI severity

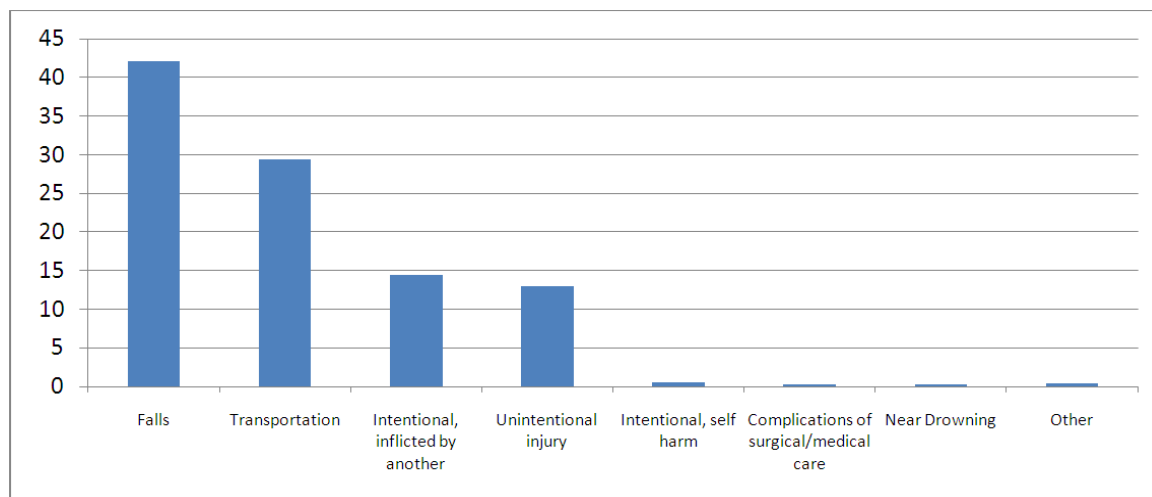
	Glasgow Coma Scale scores	Duration of Post-traumatic amnesia
Mild	13-15	<24 hours
Moderate	9-12	1-7 days
Severe	3-8	1-4 weeks

Source: Khan et al [2]

Cause of injury

The most common cause of TBI are falls, transport accidents, collision with objects and water related accidents [6].

Figure: Mechanism of injury of TBI in Australia during 2004-2005



Obtained from AIHW: Helps Y, Henley G & Harrison JE. 2008. Hospital separations due to traumatic brain injury, Australia 2004–05. Injury research and statistics series number 45. (Cat no. INJCAT 116) Adelaide: AIHW.

Morbidity

TBI can cause long-standing disability related to physical, psycho-social and cognitive impairments, which in turn decreases both functional abilities and quality of life [4,5]. The following is a list of common impairments that occur after TBI:

- Neurological impairments which affect balance, walking, hand function and sensation. These neurological impairments can cause spasticity, post-traumatic epilepsy, hydrocephalus, heterotopic ossification.

- Cognitive impairments that affect memory, learning, attention, problem solving, planning, safety awareness.
- Personality and behavioural changes can occur such as reduced social and coping skills, self-esteem, emotional control and anger management. People can also experience impulsivity, apathy, anxiety, dis-inhibition, depression, post-traumatic stress disorder and psychosis.
- Lifestyle consequences such as unemployment and reduced monetary earnings are common as are social isolation, family disintegration, increased susceptibility to substance abuse. People can also experience reduced academic achievement and therefore reduced ability to obtain suitable employment [1].

Utilisation of Health Services

People with significant TBI are high-users of a wide number of health services:

- Inpatient hospital management, which focuses on issues such as resuscitation, critical care management and surgery for the most serious cases. In people with TBI, post-traumatic amnesia management and monitoring, medical imaging to determine severity of injury, as well as pain, pharmacological and surgical management may occur [1,5].
- Rehabilitation for people with TBI is patient-specific. People may require cognitive re-training with functional tasks to facilitate community integration such as completing self-care, domestic and household duties, communication, money management, time management and community access/transportation skills. Compensatory aids and equipment are provided for physical and cognitive impairments as required [1].
- Community care, including both personal care services, to provide assistance with activities of daily living (ADL) (e.g. bathing and dressing) and instrumental activities of daily living (IADL) (e.g. preparing meals and shopping), as well as home based rehabilitation programs[4].

Table: TBI length of stay by type of episode of care

	Males	Females	Persons
Acute care	6.0 days	6.3	6.1
Rehabilitation care	63.2 days	66.9	64.2
Other care	41.5	125.3	84.1

Source: AIHW: Helps Y, Henley G & Harrison JE. 2008. Hospital separations due to traumatic brain injury, Australia 2004–05. Injury research and statistics series number 45. (Cat no. INJCAT 116) Adelaide: AIHW.

References:

- [1] Khan, F., I.J. Baguley, and I.D. Cameron, Rehabilitation after traumatic brain injury. Medical Journal of Australia, 2003. 178: p. 290-295.
- [2] Disability in Australia: acquired brain injury, 2007, Australian Institute of Health and Welfare Canberra.
- [3] 06-07 Summary report Victorian Government Department of Human Services, 2008, Victorian State Trauma Registry
- [4] Fortune, N. and X. Wen, The definition, incidence and prevalence of acquired brain injury in Australia, 1999, Australian Institute of Health and Welfare: Canberra.
- [5] Tate, R.L., S. MacDonald, ., and J.M. Lulham, Incidence of hospital treated traumatic brain injury in an Australian community. Australian and New Zealand Journal of Public Health, 1998. 22: p. 419-423.
- [6] Helps Y, Henley G & Harrison JE. 2008. Hospital separations due to traumatic brain injury, Australia 2004–05. Injury research and statistics series number 45. (Cat no. INJCAT 116) Adelaide: AIHW