

TBI evidence based literature and research review – Lay Summaries



The following information provides a summary of the best-evidence literature reviews carried out by ACC's Research Team covering a series of topics important to ensuring that people with a traumatic brain injury (TBI) receive effective and quality services.

Full copies of the best-evidence literature reviews can be downloaded by clicking on the heading for each topic.

1. Acute care of people with a head injury

There are three key stages relating to acute care of people with a head injury and the evidence relating to these have been reviewed separately and summarised below:

At the scene of the injury

Emergency services staff first treat the greatest threat to the person's life, which may not be the head injury itself. The next step is to measure the person's blood pressure and oxygen in the blood. This is because a person who has had a head injury may develop low blood pressure and/or low oxygen in their blood which can cause or worsen any damage to the brain. Emergency services will continuously monitor and treat if needed.

A tool called the Glasgow Coma Scale is used to assess the person with the head injury. This shows how severe any brain injury is and will give an indication of the risk of any problem inside the skull like brain swelling or increased pressure in the skull. If a person has been assessed as having a severe brain injury, emergency services will ring ahead to the destination hospital to make sure everything is ready to treat the person, including neurosurgery, if needed, and will transport the person with the head injury promptly to an appropriate hospital.

At the hospital

Anybody with a suspected head injury should be attended promptly at the emergency department or hospital they are transported to. Staff at the hospital will continue to monitor their blood pressure and oxygen in their blood to detect any serious injury to the brain, arrange a prompt CT scan if appropriate, and attend to co-existing injuries. The CT scan will ascertain if there is any bleeding or swelling of the brain that may need further treatment.

Any person with a head injury showing signs of a serious brain injury should be admitted to hospital where they will be monitored by the staff to ensure prompt treatment and/or a CT scan can be organised, if their condition worsens. An appropriate specialist, like an anaesthetist or critical care doctor should be involved early on.

Intensive care

The main goals in the intensive care unit are to prevent and limit ongoing brain damage, and to provide the best conditions for natural brain recovery by reducing brain swelling and any increased pressure inside the skull.

This is achieved by various treatments including keeping the brain injured person in a coma and on artificial ventilation, using medications, or surgery to remove a piece of the skull. The doctor looking after the brain injured person will provide the family information about the particular treatments used.

2. Inpatient rehabilitation for TBI

The review of best practice for inpatient rehabilitation focused on the service delivery aspects rather than the therapies that may be provided. Once clients with moderate to severe brain injury are discharged from intensive care they usually receive ongoing inpatient rehabilitation.

The review of best practice found some evidence supporting a range of practices. Some of these findings were:

- there is some evidence that inpatient rehabilitation improves self care and mobility and significantly improves functional outcome, social cognition and return to work
- multidisciplinary inpatient rehabilitation is more effective than a single discipline approach
- earlier inpatient rehabilitation is associated with better outcomes such as shorter comas and lengths of stay, higher cognitive levels at discharge and a greater likelihood of discharge to home
- training in a transitional living setting during the last weeks of inpatient rehabilitation is associated with greater independence than inpatient rehabilitation alone.

3. Employment participation

Many people with a TBI are of working age and an important part of their rehabilitation is the ability to return to some form of work or employment. Internationally; return to work rates vary from 30%-65% over 1-2 years after a TBI injury.

The approach to returning to work should be treated as a process rather than a single event. It may be useful to look at voluntary work and supported, sheltered or part-time employment as the best approach towards full-time paid employment.

Factors that negatively influence the likelihood of a person returning to work following TBI, include an increased length of stay in hospital following TBI and residual physical deficits. On the positive side, having supportive family members is beneficial.

Rehabilitative programmes focusing on assisting the brain injured person to regain the capacity to work (vocational rehabilitation) increases return to work rates. There are three types of vocational rehabilitation programme approaches following a TBI. They are: programme based; supported employment and the case co-ordination approach. The case co-ordinated approach appears to be the most effective.

4. Community integration

Community Integration is a multidimensional concept. The most important factors are; for the patient to be occupied, to have somewhere to live and to maintain and build relationships with people around them.

A tool called the Community Integration Questionnaire (CIQ) is used to measure community integration and may be completed either by a close friend or family member of the patient with TBI (if they are unable to). Testing has shown that completing the form on behalf of the person with TBI results in similar responses and gives a true reflection of what they would have said .

The severity of a TBI predicts how well a person with TBI will recover and reintegrate back into the community. This is measured by using the Glasgow Coma Scale and the Post Traumatic Amnesia scale. Following a TBI people reintegrate back into the community to different degrees, younger people who were working prior to injury often don't integrate as well when compared to older people.

There are nine different Community Integration rehabilitation programmes available for TBI clients. These include; multidisciplinary programmes (targeting physical, social, emotional and behavioural issues), intensive residential programmes (in supported housing), neuro-behavioural programmes, communication training, involvement in peer support groups, intensive case management, social community based programmes and post-acute rehabilitation programmes.

The multidisciplinary rehabilitation programme appears to be the most effective approach to help people with a TBI reintegrate into the community

5. Substance Abuse in TBI Patients

Substance abuse places people at a greater risk of accidents causing a TBI. Up to half of those who present at an emergency department or doctor with a head injury are intoxicated at the time of injury.

Screening for substance use and brief intervention at emergency departments should be considered for all patients presenting with a head injury. Patients who are too intoxicated to respond adequately should not be excluded from such screening and other methods of gathering information should be explored.

Patients who are intoxicated at the time of injury are more likely to have decreased memory and attention span and score lower on measures of IQ. Those who have a pre-injury history of alcohol abuse, have lower employment and independent living status post-injury.

Following advice from clinicians, many people who were regular substance users prior to their injury decrease their intake immediately following an injury. However these people usually increase their intake gradually from one year post injury.

Young, males have the highest levels of hazardous drinking both pre and post injury. People who return to work after their recovery may increase their substance use to cope with stress and may have easier access to drugs or alcohol because of their increase in income.

Case management that combines resources and services for the patient beyond just addressing substance abuse problems seems to be successful. The research for case management in TBI patients with substance abuse issues is still in its infancy and there is a need for further research.

6. Depression in TBI Patients

People experiencing depression suffer from a number a symptoms including; loss of interest in usual activities, weight loss or gain, insomnia, fatigue, low mood, and inability to concentrate.

Depression occurs in approximately 30 percent of people who have had a TBI. This is three or four times higher than for those in the general population. There is also an increased risk of suicide in people who have had a TBI.

People are more likely to develop depression if they have a history of depression, alcohol and drug use prior to their injury. There is some evidence that the risk of developing depression is greater

when the injury is severe, and the patient is young, and female. However, further research is needed to validate these factors.

Screening for depression in patients with a TBI is a crucial part of their overall care and should happen more than once during their rehabilitation. Screening tools used in the general population may not be appropriate for patients who have had a TBI.

TBI patients who suffer from depression often experience poorer social functioning and lower quality of life than those without depression.

Options for treating depression in TBI patients include a range of psychotherapeutic and pharmacological treatments. Brain injured patients who screen positive for depression should be referred to psychiatry services to ensure the full range of options can be explored for the treatment of their depression.

7. Challenging Behaviour and TBI

Behavioural and personality changes are common following a TBI, and are often judged by parents and families as more distressing than any physical or cognitive problems.

Externalising behaviours such as aggression, are more common than internalising behaviours, and approximately 25% of adults show aggression following a moderate to severe TBI. Personality changes and disorders are also common following a TBI. These may occur as a result of organic changes in the brain following the injury or may occur due to different coping mechanisms the person applies following their injury.

Challenging behaviour poses risk to effective rehabilitation and both social and work integration are affected. In acute settings, aggressive behaviour is often treated with medication to sedate the patient. Long term solutions for behavioural issues appear to be comprehensive/holistic approaches.

8. Impact of Aging on TBI

Although the greatest incidence of TBI occurs in young adults, the elderly population are also affected and the consequences of injury for these two groups can be profound and long term.

There is limited research evidence available on aging with a TBI and most long term studies only follow up those affected for approximately 10-15 years. Further long term studies are required.

For those who have had a moderate to severe head injury life expectancy is reduced by approximately seven years and many are left with long term disabilities which can have major consequences for activity, social participation and quality of life.

With aging following a TBI there is an increased likelihood, compared to the rest of the population, of:

- experiencing seizures, dementia, Parkinsonism, sleep problems, vision and hearing problems
- developing musculoskeletal problems like stiff, painful joints and arthritis from other injuries caused at the time of the TBI. These may result in the need for increased medications and doctors visits
- problems with thinking and memory which may affect the ability to work and socialise

- increased anxiety and nervousness – those injured at a younger age tend to experience emotional stress some time after the injury whereas those who are older at the time of injury are likely to experience early emotional stress that lessens with time
- difficulty with physical activity and participating in society which increases over time after the injury.

9. Safe transport of people with a head injury

People with head injuries need to be transported at some stage of their injury, often more than once. The evidence relating to transporting a person with a head injury has been reviewed separately and summarised below:

At the scene of the injury

Anyone with a suspected head injury should be transported promptly to a hospital for treatment of the head injury and any complications that may occur. If this is not possible, the person should be transported to a medical facility where their condition can be stabilised..

All people with a suspected head injury should have their neck immobilised until it is clear that they do not have any serious problem in that area.

For all people with a severe head injury, the destination hospital should be alerted before the patient arrives.

Transport to a neurosurgical unit from another hospital

The person with the head injury should be in a stable condition before transfer to a hospital with a neurosurgical unit. They should also be accompanied by a health professional who must be able to communicate with the hospital staff during the transfer. All people with a severe head injury should be on artificial ventilation.

Transfer from intensive care to rehabilitation unit

It is safe to transfer when the person's condition is stable and there is no need for further monitoring and intensive treatment.