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**Efficacy of Cognitive Behavioural Therapy  
for Clients who have Sustained a Traumatic  
Brain Injury (TBI)**

**A Thesis presented in partial fulfilment of the requirements  
for the degree of  
Doctor of Philosophy (PhD)  
in Psychology**

**at Massey University, Wellington  
New Zealand**

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## **Abstract**

While the focus of rehabilitation following traumatic brain injury (TBI) is often on management of physical and cognitive impairments, emotional and behavioural changes in the person with the injury may represent major hurdles in adjustment following injury. Mood, anxiety and adjustment disorders are common following TBI. A manualised cognitive behavioural therapy (CBT) treatment programme was developed that incorporated provision of education on consequences of TBI, used cognitive and behavioural strategies to recognise and manage emotional reactions to injury, and promoted achievement of personal goals. Participants were nine people with TBI referred to Massey University Psychology Clinic Wellington, for psychotherapy to assist in managing symptoms of psychological distress or adjustment difficulties following injury. Measures used included the Hospital Anxiety and Depression Scale (HADS) to monitor progress in reduction of symptoms of Anxiety and Depression; the Patient Competency Rating Scale (PCRS) to assess competency across areas of day-to-day living; and the Homework Rating Scale Second Edition (HRS-II) to assess the value of homework assignments for participants. Results were presented graphically in group format and in the form of individual case studies outlining progress in achieving individual goals. There was considerable variation in the responses of participants to treatment. When anxiety and depression were secondary to other referral issues such as fatigue and pain that remained high over treatment sessions, there was limited movement on HADS Anxiety and Depression scores. The small number of participants impacted on the ability to detect differences between Patient and Informant ratings on the PCRS or to demonstrate increased levels of awareness over treatment sessions. Consistent completion of Homework assignments proved difficult for participants. Factors that impacted on achievement of personal goals included ongoing levels of fatigue and pain, levels of personal expectation, interpersonal and organisational skills, insight into emotional reactions, and good family and social support. There is a part for a CBT approach in adjusting to changes following TBI, particularly in assisting with reassessing expectations following injury.

## **Dedication**

This research project is dedicated to my husband Nigel John Christianson, who provided support and encouragement in the initial stages of the project. While he is not able to see the final outcome of my research, his spirit has remained a source of strength and encouragement in completion of this study.

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## Chapter 1: Overview of Project

Sustaining a traumatic brain injury (TBI) can have dramatic and wide-reaching effects for both the person who has sustained the injury and those who are close to them. Effects can include impairment of physical skills and cognition (Karol, 2003). However, emotional, behavioural and psychosocial disturbances form the greatest barrier to a brain injured person's ability to reintegrate into society (Lezak, 1987). These may adversely affect the person's availability of social contact, return to work or school, and leisure activities. People with TBI may also experience changes in personality, and may lack awareness of, or have difficulty in adjusting to post-injury outcomes.

Because of recent medical advances, many people who sustain a TBI are surviving injuries that previously would have been fatal (Klimczak, Donovan, & Burright, 1997). Those affected by TBI are often young and fit at the time of injury and may face long-term disability. The difficulties they experience can magnify and increase as years go by (Dickson & Gregory, 1995). Effective rehabilitation is needed in order to assist those with TBI in adjusting to disability (Johnstone & Stonnington, 2001), with optimal results occurring when physical, psychosocial and vocational issues are considered (Mateer, Sira, & O'Connell, 2005).

In the acute stages of recovery from injury, physical, occupational, and speech therapists can assist the injured person to regain varying degrees of physical, practical and communicative skills. As recovery progresses, clinical neuropsychologists can provide assessments in order to identify functional and cognitive areas which show impairment and make recommendations for rehabilitation of deficits (Johnstone & Stonnington, 2001). A neuropsychological approach to rehabilitation involves therapeutic interventions that address cognitive, emotional and interpersonal skills, while increasing awareness and understanding (Sarajuuri & Koskinen, 2006). Evidence suggests that behavioural techniques (McGlynn, 1990; Wood, 1992) and a number of cognitive techniques (Cicerone et al., 2000; Cicerone et al., 2005; Sohlberg & Mateer, 2001; Ylvisaker, Szekeres, Henry, Sullivan, & Wheeler, 1987) can be successfully

applied to a number of problems following neurological impairment. Psychotherapy can assist people with TBI in reconstructing their lives and achieving a sense of identity (Sarajuuri et al., 2005).

As people with TBI develop an awareness of changes and impairments, they may experience some difficulty in accepting and adjusting to these consequences. Denial of impairments can represent an emotional and protective response as an injured person increasingly recognises disability (Cicerone, 1989). Following the acute stages of recovery, psychological interventions can be of value in facilitating the process of accepting and adjusting to the injury. Psychotherapy can also be used to treat depression and loss of self-esteem associated with cognitive dysfunction (NIH Consensus Conference, 1999). It can address the psychosocial consequences of TBI (Cicerone, 1989) by helping brain injured people with emotional and motivational barriers, and in re-establishing interpersonal relationships (Prigatano & Ben-Yishay, 1999). Crawford (1983) suggested that back-up services which include prolonged rehabilitation, counselling services and access to support groups be provided for a long time after the person leaves hospital.

With the exception of behaviour modification techniques, psychotherapy is often assumed to be inappropriate for people with TBI (Butler & Satz, 1988), because the potential cognitive, linguistic and affective disturbances make psychotherapy more difficult (Prigatano, 1991a). However, addressing emotional and motivational factors can assist with maximising gains from the rehabilitation processes (Prigatano, 1988). Research is needed to determine the effectiveness of various psychotherapeutic approaches in addressing the emotional and psychosocial needs of people with brain injury.

It has been suggested that Cognitive Behavioural Therapy (CBT) may be appropriate for people with TBI as it is a structured, records-based and directive approach (Cicerone, 1989; Khan-Bourne & Brown, 2003; Mateer et al., 2005). Aims of psychotherapy could include promoting awareness of changes following injury, acceptance of these changes and adjusting to altered social and vocational circumstances. Therapy would need to be adapted in order to allow for potential difficulties that can arise due to TBI e.g., impairments of memory and attention, fatigue,

and irritability. There is therefore, a place for research into the effectiveness of CBT that is tailored to the needs of people with TBI.

The current study investigated the efficacy of a cognitive-based psychotherapy programme for people who have sustained TBI. Participants and therapists were recruited through the Massey University Psychology Clinic in Wellington. The participants in the study were referred to the Psychology Clinic by the Accident Compensation Corporation (ACC) for psychotherapy to assist with psychological problems arising from having sustained a TBI. The intended design of the study was a multiple baseline study across participants, allowing for each participant to serve as his or her own control. This design was a variation on the single-case design, yielding results that are meaningful at an individual level (Wilson, 1987) and considered appropriate for situations where there is a small pool of potential participants. The therapy was time limited, consisting of 9-12 sessions, and included empirically supported cognitive techniques for working with psychological issues such as anxiety (Wells, 1997), depressive disorders (Persons, Davidson, & Tompkins, 2001), irritability (Alderman, 2003) and pain (Tyrer & Lievesley, 2003).

A number of problems became evident with the multiple-baseline design, however. Commencement of treatment was based on clinical grounds which did not allow for each participant to commence treatment once the effect of treatment had stabilised for the previous participant (Sarafino, 2005). In combination with cognitive impairment in memory and organisational skills this impacted on completion of baseline measurements. While participants were selected based on the presence of mood, anxiety and adjustment issues following TBI, in relation to returning to work, family and social activities, not all participants were found to have significant Anxiety or Depressive symptom at baseline as measured by the Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983). For a number of participants these symptoms were secondary to other presenting issues such as pain and fatigue. Accordingly, the main focus and efficacy of the CBT intervention was better described by a qualitative case study presentation.

Chapter 2 will discuss the mechanisms and acute consequences of TBI, and post-acute consequences including long term deficits and the psychosocial impact of TBI on those

with the injury and on their families. Chapter 3 outlines rehabilitation therapies that target the consequences of TBI, including psychotherapy interventions. That chapter also outlines research on the efficacy of psychotherapeutic interventions for people with TBI, and will state the research hypotheses for this study. Chapter 4 describes the preliminary work involved in setting up the project. The succeeding chapters describe the method for the project and results with a focus on both group results and individual case studies for participants. The final discussion Chapter 7 will look at the ways in which CBT may be useful in assisting with the behavioural and emotional adjustment of people with TBI.

## **Chapter 2: Traumatic Brain Injury: Acute and Long Term Consequences**

### **Acute Consequences**

A brain injury can be assumed following head trauma, if accompanied by alteration in consciousness, neurological impairment or cognitive deficit (Lucas, 1998) and can result for instance, from an object striking the head or from the brain coming into contact with the skull (Gennarelli & Graham, 2005). Injuries to the brain may be focal, multi-focal or diffuse and can often involve structures away from the initial site of impact. The number and distribution of lesions can influence where an injury falls on the continuum from mild to severe brain injury. While the severity of the initial impact may be predictive of outcome, factors such as age, pre-existing conditions, psychological sequelae and other factors also impact on long-term outcomes. Outcomes involve physical, cognitive and behavioural impairment, which may require prolonged hospitalisation and post-acute rehabilitation programmes (Gelber & Callahan, 2004).

Primary injuries occur at the time of impact, and can include lacerations of the scalp, fractures of the skull, surface contusions and lacerations of the brain, diffuse axonal injury, and intracranial haemorrhage (Gennarelli & Graham, 2005; Graham, 1995). Secondary or downstream damage may be produced by processes such as raised intracranial pressure, swelling of the brain, hypoxia/ischemia, neurochemical changes, and infection.

Open head injuries occur when the skull is crushed or penetrated by a foreign object (Lucas, 1998). Primary effects from these injuries occur due to damage to brain tissue at the site of entry and along the path of the penetrating object. Damage to blood vessels may result in intracranial bleeding. There may be lacerations of the meninges. Secondary effects result from interruption of blood flow to adjacent brain tissue, edema or swelling of brain tissue, brain infections, and posttraumatic epilepsy.

Closed head injuries occur when the skull remains intact. Contusions and lacerations of the brain are caused by contact between the surface of the brain and bony protuberances of the skull. Brain contusions at the site of impact are referred to as coup lesions.



Following the initial impact the brain can rebound and strike the skull opposite the initial blow. The resulting lesions are referred to as contrecoup lesions, and may be larger than those at the initial site of impact (Lucas, 1998). The regions of the brain that are most vulnerable to contusions following closed head injury include the poles and inferior aspects of the frontal lobes, and the poles and lateral and inferior aspects of the temporal lobes (Gennarelli & Graham, 2005).

Diffuse brain injury is caused by a number of mechanisms following acceleration/deceleration injuries, including damage to axons in the white matter of the brain, and ischemic/hypoxic damage. Diffuse axonal injury occurs with shearing and stretching of neuronal axons, which disrupts the capability of the axons to maintain ionic gradients, resulting in changes in the concentrations of potassium, sodium and chloride ions (Gennarelli & Graham, 2005). Stretching and distortion of blood vessels may lead to a reduction in cerebral blood flow, with downstream hypoxic effects resulting in neuronal destruction in areas of the brain deprived of blood supply. The cumulative effect of focal and diffuse cerebral damage affects neuropsychological outcome (Kwentus, Hart, Peck, & Kornstein, 1985), with changes in affective and cognitive response resulting from neural destruction in the associated brain areas (Prigatano, 1992b).

### **Severity of Injury**

A number of measures are relevant when discussing severity of brain injury. These are outlined in Table 2.1, p. 13 (Lucas, 1998). The most commonly used measures are Loss of Consciousness (LOC), Post Traumatic Amnesia (PTA) and Glasgow Coma Scale (GCS). LOC is the amount of time it takes for a patient to regain consciousness, while PTA is the time elapsing until the person is oriented and can consistently recall details of his or her environment (Arlinghaus, Shoaib, & Price, 2005). The GCS, a measure of responsiveness, is sensitive to moderate and severe injuries in predicting neuro-behavioural outcome, but is less sensitive towards milder injuries (Lucas, 1998).

The CBT programme for this study was aimed at clients who had adjustment needs with a psychological component following injury and who were able to take part in predominantly verbal interactions. The programme was suitable for those with mild

TBI, but was also thought to be appropriate for a number of people who sustained moderate or severe injuries. The programme was not intended for those in the acute stages of recovery or for those who exhibited severe behavioural dyscontrol. Karol (2003) suggested that those with severe behavioural difficulties would be suited to an approach that adapted the environment to the client, as opposed to adapting the client to the environment.

Table 2. 1 *Measures used to Determine Severity of Traumatic Brain Injury. (Lucas, 1998)*

Scale	Loss of Consciousness; (LOC)	Posttraumatic Amnesia; (PTA)	Glasgow Coma Scale; (GCS)
Mild Injury	For 30 minutes or less.	Less than 1 hour	At least 13 points.
Moderate Injury	Longer than 30 minutes	1 – 24 hours	9 – 12 points
Severe Injury	Longer than 30 minutes	Longer than 24 hours	8 or fewer points

### **Consequences of Traumatic Brain Injury**

Of the deficits that can arise following brain injury, physical deficits are visible, socially acceptable and may often recover quickly (Hillier & Metzger, 1997). Cognitive impairments (memory, attention, language and executive functions), and behavioural and emotional changes, while less visible, are more likely to limit the range of a person's activities and impact on their ability to reintegrate into society. These deficits are discussed separately below:

#### **Physical:**

Following TBI, any sensory, motor, and autonomic function may be compromised. Physical problems include abnormalities of muscle tone, vision, hearing, smell, taste, and speech (Chesnut et al., 1998), a variety of movement disorders, seizures, headaches, visual deficits, and sleep disorders (NIH Consensus Conference, 1999), pain syndromes and fatigue (Newburn, 1998; Tyrer & Lievesley, 2003). Improvement of mobility,

balance, coordination, vision, strength and endurance can help with vocational rehabilitation (Ninomiya, Ashley, Raney, & Krych, 1995).

### **Cognitive:**

Of the many domains of cognitive function, impairment of attention, memory, visual-spatial abilities, language, and executive skills, (Hanks, Ricker, & Millis, 2004) are most commonly affected after TBI. These difficulties are compounded by a lack of flexibility in attending, thinking and acting; slow and inefficient processing of information; difficulty with learning; and poorly organised behaviour and verbal expression (Szekeres, Ylvisaker, & Cohen, 1987).

The cognitive domains affected by TBI are described in more detail below:

*Memory.* Disorders of learning and memory are frequently seen after mild, moderate and severe brain injury (Klimczak et al., 1997) due to impairment of all processes involved in memory, e.g., encoding, consolidation, and retrieval (Skeel & Edwards, 2001). The hippocampal regions situated inside the temporal lobes, which form a major component of the memory system are particularly vulnerability to TBI (Lezak, 1995). Memory disturbances impact on psychosocial outcome and have repeatedly been identified as important predictors of eventual work status (Prigatano et al., 1986), with severe verbal learning deficits often persisting ten to twenty years following injury (Hoofien, Gilboa, Vakil, & Donovan, 2001).

*Attention.* Attentional problems that frequently follow brain injury include impairment of arousal, focused attention and divided attention (Levitt & Johnstone, 2001). Arousal refers to level of alertness, focused attention to a person's ability to focus attention on a stimulus and ignore irrelevant material, and divided attention to the ability to pay attention to more than one thing at a time. Attentional deficits may be obvious or subtle (Leclercq, Deloche, & Rousseaux, 2002), may become pronounced when a person is operating in unstructured settings (O'Shanick & O'Shanick, 1994) and are more apparent in higher-order tasks involving divided attention, working memory, and cognitive flexibility (Hanks et al., 2004). These deficits may present as a reduced capacity to maintain conversation in noisy settings, an impaired ability to read complex

diagrams or instructions, and as difficulties in interpreting simultaneous sensory events, or in perceiving the intentions and actions of others.

*Language.* Impairments of language function, including deficits of fluency, understanding, and naming objects, have been repeatedly demonstrated following TBI (McCullagh & Feinstein, 2005). Aphasic symptoms with a loss or decline in receptive or expressive language skills can emerge following damage to the left or dominant hemisphere (Prigatano et al., 1986). Verbal language deficits in expression and comprehension may be paralleled by deficits in writing and reading abilities (Holland & Larimore, 2001). Non-aphasic language disturbances are also seen after TBI. These can impact on social adaptation, and include problems such as talkativeness or verbal expansiveness, tangential thought patterns in conversation, and the use of peculiar words or phrases (Prigatano et al., 1986).

*Visual-spatial abilities.* The ability to represent and manipulate spatial information is crucial for a wide range of perceptual, cognitive and motor functions (McCloskey, 2001). Many parts of the brain are involved in the perception, processing, and interpretation of visual-spatial stimuli (Shaw, 2001), with complicated neural networks involving the eyes, optic nerves and cerebral cortex working together to process and integrate visual input. Even minor impairment in one of these areas will decrease the effectiveness of the visual-spatial system. Damage to cortical areas can lead to disorders in coding properties of images such as colour, form, depth and motion (Riddoch & Humphreys, 2001).

*Executive functions.* Lezak (1995) describes the executive functions as those abilities that enable a person to engage in independent purposive behaviour. They include higher order skills such as problem solving, abstraction, concept formation, cognitive flexibility, and self-regulation (Hanks et al., 2004). Impairments in abstract reasoning ability may be reduced following TBI due to injury occurring to structures in the frontal lobes, which may impact on working memory. Judgement may be impaired due to difficulties in scanning and assessing relevant components of a current situation, and in controlling impulsivity (O'Shanick & O'Shanick, 1994). The reduced cognitive ability to perform complex actions may lead to disturbances in initiation and abstract reasoning. Following TBI, people may interpret instructions in a literal or concrete

manner, show pronounced perseverative errors and find it difficult to inhibit or change activities (Prigatano et al., 1986).

### **Emotional:**

TBI can also impact on a person's emotional, behavioural and social functioning thus affecting the way the person behaves in social situations. Common behavioural deficits include decreased ability to initiate responses, verbal and physical aggression, learning difficulties, shallow self-awareness, altered sexual functioning, impulsivity and social disinhibition. Mood disorders, personality changes, egocentricity, emotional lability, depression, anxiety and isolation are also prevalent after TBI (Chesnut et al., 1998; NIH Consensus Conference, 1999). Social interactions can present major areas of difficulty, as they draw on a number of cognitive skills, e.g., memory, attention, language. Hoofien and colleagues (2001) found that brain injury survivors and family members perceived their social functioning as being the most problematic, as compared to other areas.

*Emotion and motivation.* Emotion and motivation following TBI can be disturbed due to impairments in cognitive processes, affective experience, and affective expression and regulation (Miller, 1991; Prigatano, 1992b), and may also result from specific structural damage to various regions of the brain. Emotions have the adaptive function of providing sensations of comfort or discomfort that indicate whether a situation is safe or threatening, while motivation provides the impetus to work towards a desirable goal. Generation of emotions is mediated by sub-cortical structures (e.g., limbic structures), while conscious feelings require the input of higher cortical centres e.g., prefrontal cortex (Lane & McRae, 2003). Damage to any of these areas may disrupt emotional processes. Emotion and motivation may also be influenced by environmental factors, pre-morbid characteristics and neurotransmitter disturbances.

Emotional reactions after injury may be related to recognition of impaired abilities and a changed self concept. Prolonged or repeated difficulty in resuming former work and social activities may lead to increasing distress over time (Cicerone, 1989). A "catastrophic" reaction can occur when people are unable to cope with environmental demands that they previously may have handled with ease (Prigatano, 1992b). An

inability to think through a solution may lead to becoming overwhelmed emotionally with consequent increases in psychological distress. Expressions of this catastrophic reaction can range from being explosive, for example screaming, lashing out, throwing things, to more subtle responses, such as passive withdrawal, regressive behaviour, hostility to others or sullen behaviour (Miller, 1991). Apathy, which is closely linked to motivation and emotion, has been described as diminished motivation that is not a result of diminished level of consciousness, cognitive impairment, or emotional distress, and in TBI can result from disruption to a core circuit involving the anterior cingulum in the prefrontal cortex, and the nucleus accumbens, ventral pallidum, and ventral tegmental area (Marin & Chakravorty, 2005).

*Neurological basis for emotional processes.* Emotions represent feedback and control mechanisms that alert an individual to elements of danger and threat. Derryberry and Tucker (1992) have described the development of brain structure as an evolutionary progression in which primitive control systems of the brainstem have been overlaid by the more complex limbic and cortical networks. Mechanisms of emotion are found in the brainstem and hypothalamic regions and also in the higher level limbic and cortical regions. Circuits in the brainstem and hypothalamic regions regulate endocrine, autonomic and motor systems in the body. As the brain evolved, the limbic system became more responsive to emotional triggers from the environment. Finally, cortical structures evolved with sensitive emotional responses and greater cognitive capabilities that enabled planning and anticipation. Coordination of emotional responses is enabled by neural connections between the advanced and more primitive levels of the brain (Derryberry & Tucker, 1992).

### **Traumatic Brain Injury: Post-Acute Consequences**

The wide ranging impact of TBI on brain function (Eames, 2001) has consequences for a person's social, economic and personal independence, with rebound effects impacting not only on the individual, but also on friends, family and society. The combination of the brain injury, pre-injury circumstances and factors surrounding the injury may lead to psychosocial changes and to secondary reactive disorders. Affective disorders (Fann et al., 2004) and specific anxiety disorders (Deb, Lyons, Koutzoukis, Ali, & McCarthy, 1999) are among the more common reactive conditions following brain injury.

### **Psychosocial Issues:**

People with neurological injuries such as TBI, have an elevated risk of developing mental health disorders (Williams & Evans, 2003). Symptoms likely to worsen during the first six months post-trauma include variability in mood, depression, emotional withdrawal, agitation/hostility, and apathy (Dunlop et al., 1991). Assaults, prior history of alcohol abuse, location of injury (Dunlop et al., 1991) pre-morbid impulsivity and male gender (Burton & Volpe, 1988) can impact on emotional pathology. Psychosocial difficulties following TBI can lead to recurrent difficulties with anger management and substance abuse (Delmonico, Hanley-Peterson, & Englander, 1998).

Changes in personality following brain injury may involve impaired judgement, alteration in a sense of self, childish behaviour, and an inability to learn from social experience. For survivors of TBI, their self-concept can easily be devastated by the loss of opportunities, freedoms and activities (Persinger, 1993). In a study of late outcome of very severe blunt head trauma, Thomsen (1984) found that permanent changes in personality and emotion were reported in two thirds of patients and were especially frequent among the youngest patients.

Psychiatric problems, particularly depression and anxiety, have been found to be common in survivors of TBI (Fann, Katon, Uomoto, & Esselman, 1995). Manifestation of symptoms of psychological distress is influenced by the interaction of post injury physical, behavioural, cognitive and emotional deficits, premorbid personality traits, and psychosocial environmental factors (Deb et al., 1999; Klimczak et al., 1997; Lewis, 1991; Rao & Lyketsos, 2002). Hoofien and colleagues (2001) noted that long after injury, disability is related more to psychiatric and behavioural symptoms than to cognitive aptitudes and abilities. A number of researchers have written about the association between TBI and psychological symptoms and disorders. These can include symptoms of anxiety, depression, irritability, pain syndromes, suicidal ideation, mania and psychosis. Table 2.2 p. 22, provides a brief outline of various studies in this area.

1. *Depression:* Affective disorders are among the more common psychological outcomes following TBI. The prevalence of major depressive disorder can be between 15.6% and 6% (Kim et al., 2007). However, caution needs to be taken with the diagnosis of post-TBI depression, as a number of symptoms of major depression, such as changes in sleep, appetite, or libido, can be secondary to the injury itself (Butler & Satz, 1988; Rao & Lyketsos, 2002). A person with TBI may appear depressed, with symptoms of memory dysfunction, slowed movements, apathy, lack of initiation, and blunted emotional expression, in the absence of a major depressive disorder. He or she may begin to improve in mood while affect and behaviour continue to appear dysfunctional (Butler & Satz, 1988). Brain-injured people may feel worthless, helpless and frustrated, and demonstrate loss of interest in work and family activities. Reactions to psychosocial changes may impact on prolonged or delayed onset depression (Robinson & Jorge, 1994). Symptoms of depression may be superimposed on cognitive deficits arising from the brain injury (Khan-Bourne & Brown, 2003). A number of authors have investigated the incidence of depression in TBI populations (Deb et al., 1999; Fann et al., 1995; Federoff et al., 1992; Jorge et al., 2004; Leon-Carrion et al., 2001; Robinson, Boston, Starkstein, & Price, 1988). Deb and colleagues (1999) found a significantly higher rate of depression in TBI patients than reported in the normal population. Fann, Katon, Uomoto and Esselman (1995) found that patients with major depression were more likely to report post-concussion symptoms. Federoff and colleagues (1992) concluded that premorbid factors and lesion location were associated with major depression.
2. *Anxiety:* People with TBI often have reduced ability to adapt to their environment and as a result, are less able to manage anxiety or use it as a signal to indicate potential areas of threat. A number of anxiety disorders have been observed in individuals who have experienced TBI. Social phobia has been identified as the most frequently occurring phobic disorder (Newburn, 1998), however, this may be influenced by withdrawal from work and social situations. Obsessive-compulsive symptoms may appear as the person tries to achieve maximal control over his or her environment (Miller, 1991) with the development of some obsessive characteristics as an adaptation to impairment in cognitive abilities such as memory and attention. People with TBI may



experience symptoms of Post-Traumatic Stress Disorder (PTSD) (Bryant, 2001; McMillan, Williams, & Bryant, 2003), characterised by sleep disturbance, ruminations, hyperirritability, and social withdrawal (Leber & Jenkins, 1996). See Table 2.2 p. 22, for studies investigating the incidence of anxiety disorders following TBI (Deb et al., 1999; Fann et al., 1995; Jorge et al., 2004).

3. *Irritability and Aggression:* Irritability following TBI may be influenced by a number of factors, including neuro-anatomical conditions, and psychosocial and psychopathological factors (Alderman, 2003). In the acute stages following injury, irritability may be caused by organic dysfunction, while in post-acute stages adjustment issues may have a stronger influence. Aggressive behaviour may be a reflection of irritability, or may arise due to organic factors. These may include damage to the limbic system (Persel & Persel, 2004), poor frustration tolerance (Swan & Alderman, 2004), reduced impulse control, poor insight, or exacerbation of pre-injury personality traits. Aggression, particularly when this involves physical assaults (Alderman, 2001), creates special problems for caregivers and the person with the injury, as it can limit access to rehabilitation opportunities, and prevent the person from receiving adequate care (Kim, Manes, Kosier, Baruah, & Robinson, 1999). See Table 2.2 p. 22, for incidence of irritability following injury (Kim et al., 1999).
4. *Pain Syndromes:* Acute pain often accompanies the initial stages of brain damage, particularly in severe cases of TBI, as multiple injuries may be present (Tyrer & Lievesley, 2003). Headache is a common consequence of TBI, and is one of the symptoms of post-concussion syndrome. Pain impacts on recovery from TBI (Lahz & Bryant, 1996) as it has an effect on cognitive functions such as attention, memory, speed of processing and executive functions. Pain and PTSD following severe TBI may interact in a way that impedes rehabilitation (Bryant, Marosszky, Crooks, Baguley, & Gurka, 1999). Pain may be associated with an increase in insomnia complaints, particularly with sleep maintenance (Beetar, Guilmette, & Sparadeo, 1996). Many people who experience pain following injury become reluctant to resume activities in case this exacerbates the pain and can become reliant on others, with a consequent reduction in independence. Individuals who sustain physical injuries with associated pain following trauma may also have undiagnosed TBI. Andary and colleagues (1997) suggest that chronic pain patients with repeated normal

diagnostic tests and numerous unsuccessful treatments for pain should be questioned about the possibility of concurrent TBI. See Table 2.2 p. 22, for incidence of pain following TBI (Andary et al., 1997; Beetar et al., 1996; Lahz & Bryant, 1996).

5. *Personality Changes*: Common personality traits associated with brain injury include difficulties with frustration, problem solving, self-monitoring, concrete thinking, new learning and memory, impairment of judgement and insight, inappropriate expression of affection, and being irritable, impulsive, and less motivated (Delmonico et al., 1998; Franulic, Horta, Maturana, Scherpenisse, & Carbonell, 2000). Premorbid characteristics of the patient may frequently be exaggerated after injury, whereas other patients may show drastic alterations or “reversals” (Cicerone, 1989). Many survivors of TBI have histories of substance abuse and difficulties with interpersonal relationships. After injury, these issues combined with dysfunction resulting from the trauma can lead to verbal or physical aggression, generalised anger, and an inability to abstain from substance abuse (Delmonico et al., 1998).
6. *Suicide*: The association between depression following TBI and suicide has been investigated (Leon-Carrion et al., 2001; Simpson & Tate, 2002; Teasdale & Engberg, 2001), with an emphasis on identification of risk factors. Suicide risk can continue for a number of years post-injury (Teasdale & Engberg, 2001), with risk factors including psychiatric disturbance (Simpson & Tate, 2002) and limited cognitive resources to cope with complex and demanding situations (Leon-Carrion et al., 2001). See Table 2.2. p. 22 for a full list of studies.

These studies suggest that people with TBI can be at risk of experiencing psychiatric conditions e.g., depression and anxiety, an associated risk of suicide, pain conditions, and irritability. A psychotherapy intervention for people with TBI needs to be sufficiently flexible to be able to be adapted to this variety of presentations.

Table 2. 2

*Studies of Outcomes in People with TBI.*

Authors	Number in Sample	Percentages with Diagnoses	Additional Findings
Depression and anxiety			
Federoff, J. P., Starkstein, S. E., Forrester, A. W., Geisler, F. H., Jorge, R. E., Arndt, S. V., & Robinson, R. G. (1992).	N = 66	27% met criteria for major depression	Major depression was significantly associated with premorbid factors and lesion location, (sub-cortical and basal ganglia lesions).
Deb, S., Lyons, I., Koutzoukis, C., Ali, I., & McCarthy, G. (1999).	N = 164	Of 120 patients in 18-64 age range, 21% had psychiatric illness; 13.9% had depression, 9% had panic disorder.	Risk factors included prior history of psychiatric illness, unfavourable GCS outcome, lower MSE score and fewer years of formal education.
Fann, J. R., Katon, W. J., Uomoto, J. M., & Esselman, P. C. (1995).	N = 50	26% had current major depression; 24% had current generalised anxiety disorder; 8% had current substance abuse.	Depression and anxiety are common in TBI patients. Depressed patients reported more symptoms that increased in severity over time.

Authors	Number in Sample	Percentages with Diagnoses	Additional Findings
<b>Irritability and Aggression</b>			
Kim, S. H., Manes, F, Kosier, T., Baruah, S., & Robinson, R. G. (1999).	N = 66 consecutive patients with closed head injuries.	33.3% had irritability in the 1 year follow-up period; 12 of 66 (18.2%) patients had acute onset irritability; 10 (15.1%) had delayed onset irritability.	Acute onset irritability – higher frequency of left cortical lesions; delayed onset irritability – associated with poorer social functioning and greater impairment in ADLs. Those with irritability had less severe head injury than those who were non-irritable.
<b>Pain Syndromes</b>			
Andary, M. T., Crewe, N., Ganzel, S. K., Haynes-Pepi, C., Kulkarni, M. R., Stanton, D. F., Thompson, A., & Yosef, M. (1997).	N = 65 pain patients. N = 12 patients with previously untreated TBI; 12 patients without TBI.	21 of 65 pain patients (32%) had MTBI. Participants for this study: 12 with previously untreated MTBI, 12 without brain injury.	Pain patients may have concurrent TBI. Most of these people can achieve successful employment outcomes, but TBI groups require longer treatment time.
Lahz, S. & Bryant, R. A. (1996).	N = 132	Mild TBI: 58% Moderate/Severe TBI: 52%	Cognitive impairment may impede pain reporting. Chronic pain may compound the psychosocial stress experienced by people with TBI.
Beetar, J. T., Guilmette, T. J., & Sparadeo, F. R. (1996).	Mild TBI: N = 127; Moderate/Severe TBI: N = 75; General neurologic group: N = 123.	TBI group: 58.9% experienced pain; 56.4%, insomnia. Non-TBI group: 22% experienced pain; 30.9% insomnia.	People with TBI have significantly more pain and insomnia complaints than those without TBI. The presence of pain is associated with an approximately twofold increase in insomnia.

Authors	Number in Sample	Percentages with Diagnoses	Additional Findings
<b>Suicide</b>			
Leon-Carrion, J., Serdio-Arias, M. L., Cabezas, F. M., Roldan, J. M. D., Morales, R. D., Martins, J. M. B., & Sanchez, M. A. M. (2001).	N = 39	48.6% were depressive; and of these, 65% were at clinical risk for suicide. 25% had low suicide risk; 15.6% had depression without suicide risk.	Suicide-prone person tended to be an emotional person with cognitive difficulties and few intellectual resources.
Simpson, G. & Tate, R. (2002).	N = 172	35% displayed hopelessness, 23% suicide ideation, 18% had made a suicide attempt post-injury.	High co-morbidity between suicide attempts and emotional/psychiatric disturbance, particularly hopelessness and suicide ideation. Neither injury severity nor pre-morbid suicide risk factors contributed to elevated levels of suicidality post-injury.
Teasdale, T. W. & Engberg, A. W.	Concussion: N = 126 114; cranial fracture: N = 7560; contusion / haemorrhage: N = 11 766.	Concussion: 750 (0.59%)  Cranial fracture: 46 (0.61%)  Contusion/haemorrhage: 99 (0.84%).	Increase in mortality ratios (3.0, 2.7, 4.1), to the general population. Increase may be due to premorbid psychosocial factors. Risk could continue for a number of year post-injury (for at least 15 years reported in the study).

Note: ADL = Activities of Daily Living; GCS = Glasgow Coma Scale; LH = Left Hemisphere; MSE = Mental State Examination; MTBI = Mild Traumatic Brain Injury; RH = Right Hemisphere; TBI = Traumatic Brain Injury.

### **Disturbances in Self-Awareness**

Many people may deny the existence of impairment following brain injury (Pollack, 1994), with disturbance in awareness of neuropsychological and behavioural changes being well recognised (Butler & Satz, 1988; Prigatano & O'Brien, 1991). They may recognise that their lives have changed, but regard themselves as normal, underestimating the impact of these changes (Prigatano & Altman, 1991). Physical changes may be more readily acknowledged than those related to cognitive or emotional disability. A person may have difficulty in recognising deficits in memory, attention, speech, planning and judgement, and in general intellectual ability. He or she may not recognise personality changes and other psychological symptoms (Butler & Satz, 1988). Disorders of self-awareness have two major implications for rehabilitation. People with TBI who lack self-awareness may continue in a number of socially maladaptive behaviours. Self-awareness is also important for promoting relearning following injury (Prigatano, 1991c).

### **Neurological Basis for Impairments in Awareness**

The area of the brain that has been injured impacts on the nature of impairments in awareness (Prigatano & O'Brien, 1991). The frontal and temporal lobes are vulnerable in severe closed head injuries, with injuries to these areas damaging the ability to integrate perceptions and emotions (Prigatano, 1989b). Lesions of the prefrontal regions may impair the ability to anticipate change, which impacts on social judgement. Self-awareness of the body may be influenced by the inferior parietal lobe, while self-perception of linguistic output may be highly dependent on the superior marginal and angular gyrus as well as the superior portion of the temporal lobe (Prigatano, 1991c). Awareness in memory deficit may be impaired with frontal lobe damage, but unaffected by restricted temporal lobe damage (Schacter, 1991). Hemispheric differences may also be observed with changes in self-awareness. Prigatano (1994) describes people with left hemisphere damage presenting as more cautious and self doubting than those with right hemisphere lesions.

## **Denial of Deficits**

The factors that contribute to altered self awareness can be of neurological and non-neurological origin (Prigatano & Altman, 1991), as social, emotional and motivational factors can interact with organic problems to determine a person's level of self-awareness.

- 1: *Organic Denial.* Organic denial refers to that resulting from damage to certain areas of the brain disrupting self-concept and cognition (Deaton, 1986). Lack of self-awareness may lead to a lack of concern and deficient monitoring of behaviour. Consciousness and self-awareness have been described as the highest psychological attributes of the frontal lobes (Stuss, 1991). A lack of awareness resulting from damage to the frontal lobes can impact on rehabilitation activities, as a person will not perceive the need for rehabilitation if he or she does not recognise changes from pre-injury abilities.
  
- 2: *Psychological Denial.* Denial may also represent an emotional and protective response in the face of increasing emotional distress due to recognition of disability (Cicerone, 1989). Denial is not necessarily harmful (Deaton, 1986), and Cicerone (1989) suggests that in some cases, people should be allowed to maintain their denial especially when it does not interfere with therapy or daily activities . Denial may allow a person to pace his or her recovery following trauma by reducing excessive amounts of distress (Janoff-Bulman & Timko, 1987), with the need for denial reducing as a person's sense of competence and self-esteem improves (Pollack, 1994). However, acknowledgement of deficits yields a better outcome than does denial, and denial can be a disadvantage when it is interfering with maximal functioning or participation in rehabilitation programming (Deaton, 1986).

## **Social Factors in Awareness Issues**

A person who has sustained a TBI may present with a different perception of his or her difficulties than that of family or caregivers. Following injury, families can also find that it is difficult to accept the changes that have occurred. Social and cultural factors may influence acceptance of the implications of TBI.

- 1: *Patient/Family Perceptions.* Family members often initiate professional intervention, as people with TBI may not be fully aware of their residual impairments. They may insist that their neuropsychological deficits are minimal, while relatives report that these deficits greatly disturb day-to-day activities. One approach to the problem of assessing self-awareness is to ask people with TBI to rate their degree of competency on a variety of behavioural tasks and to compare their rating to relatives' ratings, using a rating scale such as the PCRS (Prigatano et al., 1986). People with TBI tend to underestimate their behavioural limitations in handling social and emotional interactions. Prigatano, Altman and O'Brien (1990) found that judgements concerning activities of daily living tended to be in agreement with relatives' ratings. However, some specific issues resulted in strong disagreement, for example, the person's ability to care for personal finances or drive a car. Using multiple sources of information, including both the person with TBI and family members, is recommended in order to obtain an assessment of post-injury abilities (Cannon, 2000; Sbordone, Seyranian, & Ruff, 1998).
  
- 2: *Cultural Factors.* Prigatano and Leathem (1993) tested a sample of New Zealanders with TBI using the PCRS, comparing people with Maori ancestry to those with non-Maori (European) ancestry. The authors wished to determine whether cultural factors influenced a person's ratings of his or her behavioural problems after injury. Results showed that Maori New Zealanders reported less behavioural competency on the PCRS as compared to non-Maori New Zealanders, a finding that differed from the predicted direction of difference. This finding suggested that cultural variables might influence perceptions that people with TBI have of behavioural limitations after brain injury. The authors concluded that brain damage may cause a dissociation between awareness of behavioural competence and actual behavioural skills, but cultural (and therefore to some degree emotional) variables may influence the direction and extent of these misconceptions.



## **Social Impact of Traumatic Brain Injury.**

### **Long-term Consequences of Brain Injury**

The consequences of TBI may endure across the lifespan, impacting on individuals and their families, and placing additional burdens on the community (NIH Consensus Conference, 1999). Moderate disability may lead to personality changes and family disruption. Severe injury leading to changes in a person's social skills, cognitive capacities, physical appearance and abilities, frequently results in fewer social contacts, disruption of marriage, alienation and isolation (Levin, Benton, & Grossman, 1982; Nadell, 1991). People with TBI may experience a range of difficulties in returning to prior work situations, particularly those who previously held high level positions (Prigatano et al., 1986).

A number of researchers have looked at both short term and long term sequelae to head injury. Thomsen (1984) followed up 40 patients with very severe blunt head trauma 10-15 years after their accidents. She found that the personality of young people with TBI appeared to be particularly vulnerable following severe trauma, with most facing disability for life. Emotional changes and disturbed behaviour were often serious problems for relatives, while loss of social contact remained the injured person's most disabling handicap in everyday life, with families also often becoming isolated. However, late results indicated that while people with injury might remain disabled, improvement in psychosocial function could continue to improve over a number of years.

Recent studies have also investigated long term outcome following TBI. Hoofien and colleagues (2001) found that following injury, a number of people experienced difficulty in maintaining employment for prolonged periods of time, which adversely affected their prospects for advancement at work. Many were working in routine occupations, with little requirement for initiative or creativity. High unemployment rates and low occupational levels impacted on income, highlighting the economic burden of TBI on the families and on society in general. There was a significant relationship between unemployment and symptoms of psychological distress, with psychological status significantly related to relatives' burden and the social functioning of participants. Schretlen (2000) found that people with higher levels of education at time of injury, lower distractibility, and lower levels of neuroticism were more likely to be employed, married

and licensed to drive, and less likely to have required psychiatric hospitalisation since their initial injury.

Changes in social skills can cause problems for many people with TBI, with the quality of social contact impacting on long-term psychosocial adjustment (Crisp, 1994). A person's difficulties with interpretation and reaction to social situations, and inappropriate content of speech may make social interactions generally unrewarding for others (Franulic et al., 2000). There may be decreased opportunities for establishing new social contacts and friends, and engaging in leisure activities, often due to a high incidence of people living at home with their families (Morton & Wehman, 1995).

Predicting social and vocational outcome for those who have suffered a severe TBI is a complex task (Prigatano, 1991a), as recovery may not proceed evenly across various cognitive areas and personality changes and symptoms of psychological distress may take some time to become apparent. Attempting to resume former social and work activities prematurely may lead to failure and rejections, which in turn may lead to increasing reliance on family members for support and a decline in satisfying relationships with peers. As people with TBI become more isolated, they become more vulnerable to psychiatric disability.

### **Impact on the Family**

A TBI is traumatic for both the person with the injury and their family (Butler & Satz, 1988; Lezak, 1986; Miller, 1993). Family members often provide support and act as caregivers for prolonged periods of time, and it is necessary to consider their psychological needs as well as those of the injured person (Kay & Cavallo, 1994). Denial also occurs in family members (Butler & Satz, 1988; Miller, 1993; Rosenthal & Young, 1988). Some families may have an unshakeable belief in the injured person's potential for future recovery, underestimating changes and thinking of the person they remember from before the injury, when they are often faced with a different person (Lezak, 1986; Livingston & Brooks, 1988). Denial is maladaptive when it prevents realistic planning for the future; however, it may serve an adaptive function when it maintains family stability and role functions. Supportive family counselling can assist with acceptance and adaptation to disability and its consequences (Lezak, 1996; Rosenthal & Young, 1988).

Depression in family members is a common consequence of head injury (Livingston & Brooks, 1988; Miller, 1993), with marital relationships often disrupted following brain injury. With more severe injuries, partners may feel married to a different person, one whom they no longer find attractive (Kay & Cavallo, 1994). Partners can find it more difficult than parents to accept the often childish and inappropriate behaviour of a person with TBI (Miller, 1993). Divorce may follow marital difficulties associated with TBI (Florian & Katz, 1991).

Families can experience ongoing feelings of loss and mourning (Kay & Cavallo, 1994; Lezak, 1986), with negative feelings toward the injured person (Kreutzer, Kolakowsky-Hayner, Demm, & Meade, 2002). Families can benefit receiving information about the consequences and treatment of brain injury (Klonoff & Prigatano, 1987; Miller, 1993; Prigatano et al., 1986; Sinnakaruppan & Williams, 2001), and from having the opportunity to talk with members of other families about their experiences (Kreutzer et al., 2002; Prigatano et al., 1986).

### **Studies on Impact of TBI on the Family**

A number of studies have investigated the social impact of TBI on families. Early studies (prior to 1990) were conducted by Oddy, Humphrey and Uttley (1978a; 1978b), Oddy and Humphrey (1980), Oddy, Coughlan, Tyerman and Jenkins (1985), Rosenbaum and Najenson (1976) and Mathis (1984). More recent studies (since 1990) have been conducted by Orsillo, McCaffrey and Fisher (1993), Moules and Chandler (1999), Curtis, Klemz and Vanderploeg (2000), and Perlesz, Kinsella and Crowe (2000). These studies are summarised in Table 2.3, p. 32.

Oddy and colleagues (Oddy et al., 1985; Oddy & Humphrey, 1980; Oddy et al., 1978a, 1978b) conducted a series of studies in which they looked at the social recovery achieved by young adults with closed head injury (CHI) over periods ranging from six months to seven years post-injury. Initial studies investigating impairment, social recovery and stress on relatives found that personality changes in the injured person had a bearing on the stress experienced by relatives. At two year follow-up, pre-morbid personality was

found to have an association with social recovery and those with the more severe injuries had difficulty in resuming work or leisure activities. Seven year follow up demonstrated that disabilities and social relationships had changed little over the intervening five years, with improvement when it occurred being evident at the two year stage.

Rosenbaum and Najenson (1976) found that one year after injury, wives of severely brain injured soldiers experienced disturbing changes in their lives, which were closely related to various symptoms of depression. Mathis (1984) found family members of patients with acute brain injury had distinct needs, particularly for planning while the patient was in an intensive care situation.

In recent studies, Orsillo, McCaffrey and Fisher (1993) found that siblings of severely head-injured people may experience significant psychological distress as long as five years post-injury; and Moules and Chandler (1999) found that carers can experience feelings of isolation, prioritising the needs of the injured person and neglecting their own. Curtiss, Klemz and Vanderploeg (2000) observed that previously balanced families may move to a more extreme functioning structure following severe TBI, in order to meet increased demands. Families can, however, be a source of long-term support for both those with the injury and their carers, with many showing similar levels of psychological well-being and family satisfaction to those reported in the general community (Perlesz et al., 2000).

Table 2. 3

*Studies on Social Impact of TBI on Patients and their Families.*

Authors	Number of Participants	Timing of Follow-up	Measures of Outcome	Findings
Oddy, M., Humphrey, M., & Uttley, D. (1978).	50 young adults with severe CHI.	6 months after injury.	KAS; task distribution checklist; and Wakefield Depression Inventory.  Interview with close family member, regarding social recovery, work, leisure activity, boredom, and family and marital relationships.	Most patients had resumed activities. Loss of work, social isolation, reduced leisure activity, and boredom confined to very severe injury group. Family relationships satisfactory at this stage.
Oddy, M., Humphrey, M., & Uttley, D. (1978).	50 young adults with severe CHI.	6 months after injury;  12 months after injury.	KAS; interview with close relative; Wakefield Depression Inventory, and verbatim reports to assess stress on relatives.	Stress showed no sign of diminishing with time. Crucial factors were personality change in the patient and relative's own perceptions.
Oddy, M., & Humphrey, M. (1980).	39 young adults with severe CHI, from the above samples.	2 years after injury.	Postal follow-up, including a symptom checklist; and brief questionnaire on social adjustment, motor and sensory sequelae and personality and cognitive deficits.	Most patients had returned to work, but some had not regained full working capacity. More severely injured had restricted leisure and social activity.

Authors	Number of Participants	Timing of Follow-up	Measures of Outcome	Findings
Oddy, M., Coughlan, T., Tyerman, A., & Jenkins, D. (1985).	34 young adults with severe CHI, from the above samples.	7 years after injury.	Bond Neuropsychological Scale; Clinical Interview; Raven's Progressive Matrices; Mill Hill Vocabulary Scale. Interview with close relatives.	Disabilities and social relationships of the patients had changed little over a further 5 years. Improvements were mainly for those who showed good progress at 2years.
Rosenbaum, M., & Najenson, T. (1976).	30 Israeli women: 10 married to brain injured men; 6 married to paraplegics; 14 married to uninjured war veterans.	1 year following the injury.	4-part questionnaire; 1) Aspects of family life, 2) Family relationships and social life, 3) Questions selected from Marital Roles Inventory, 4) Symptoms of disturbances in mood.	Wives of severely brain-injured men had experienced disturbing changes in their lives, especially with interpersonal relationships with their husbands, in-laws and friends.
Mathis, M. (1984).	15 family members of patients without brain injury; 11 of patients with brain injury.	Data collection over 4 months post-admission to ICU.	Structured interview guide (Molter, cited in Mathis, 1984).	Needs of family members with a brain-injured patient differ to those of a patient without brain-injury.

Authors	Number of Participants	Timing of Follow-up	Measures of Outcome	Findings
Orsillo, S. M., McCaffrey, R. J. & Fisher, J.M. (1993).	8 female, 5 male siblings of TBI survivors.	Following rehabilitation of the injured sibling.	ASQ; BSI; DAS; FAD; PSI; RBI; WCCL.	Siblings of head-injured individuals who are psychologically distressed display cognitive and behavioural difficulties.
Moules, S., & Chandler, B. J. (1999).	Carers of TBI patients: 3 fathers, 6 husbands, 8 mothers, & 5 wives	Mean time since injury 6 years; range was 1 year, 8 months to 17 years.	SEIQoL-DW; GRIMS; GHQ-28 item version; FNQ.	The quality of life among carers was lower than in the general population. Priorities in needs were issues relating to the individual with TBI.
Curtiss, G., Klemz, S., & Vanderploeg, R.D. (2000).			Couples Version of FACES-II; CRI.	60% of all families experienced significant change in structure following TBI, with balanced families changing the most.

Authors	Number of Participants	Timing of Follow-up	Measures of Outcome	Findings
Perlesz, A., Kinsella, G., & Crowe, S. (2000).	79 families; involving 65 individuals with TBI; 72 primary carers; 43 secondary carers; 22 tertiary carers.	12-60 months post-trauma.	BDI; STAI; POMS; FSS.	Those with TBI are at greater risk than their relatives; primary carers, especially wives are at greatest risk of distress; many secondary and tertiary carers also show high levels of distress.

**Notes:** ASQ = Attributional Style questionnaire; BDI = Beck Depression Inventory; BSI = Brief Symptom Inventory; CRI = Coping Responses Inventory; DAS = Dysfunctional Attitude Scale; FAD = McMaster Family Assessment Device; FNQ = Family Needs Questionnaire; FSS = Family Satisfaction Scale; GHQ = General Health Questionnaire; GRIMS = The Golombok Rust Inventory of Marital State; ICU = Intensive Care Unit; KAS = Katz Adjustment Scale; POMS = Profile of Mood States; PSI = Problem Solving Inventory; RBI = Rational Behaviour Inventory; SEIQoL-DW = The Schedule of Evaluation of Individual Quality of Life – Direct Weighting; STAI = State-Trait Anxiety Inventory; WCCL = The Revised Ways of Coping Checklist.



## **Chapter 3. Rehabilitation following Traumatic Brain Injury.**

Rehabilitation following TBI can include a number of approaches. This chapter will briefly outline the aims of behavioural and cognitive rehabilitation, and discuss interventions to increase a person's level of self awareness. There will be discussion of the issues that can arise in providing psychotherapy interventions for people who have sustained a TBI. Empirical studies on psychotherapy for people with TBI will be reviewed, along with the difficulties that can arise in conducting clinical research with this population.

The goals of behavioural and cognitive rehabilitation following TBI are to improve a person's ability to function in everyday life by enhancing his or her capacity to organise daily activities, to attend to and process information, and to interact with others in a socially appropriate manner. Those involved in the care of people with TBI in the acute hospital setting include neurosurgeons, nursing staff, physiotherapists, occupational therapists, speech therapists, and social workers. In post-acute settings, additional staff include clinical psychologists and neuropsychologists, who perform assessments and make recommendations for rehabilitation programmes. Neuropsychological assessment is necessary prior to implementation of cognitive remediation, in order to provide a baseline for comparison (Sherer & Novack, 2003) and to determine the person's areas of relative strength and weakness. Psychologists can also have a primary treatment role in the provision of psychotherapy services to people with TBI and their families (Nelson & Adams, 1997).

### **Behavioural Rehabilitation**

An initial focus following TBI can be on physical recovery, with less emphasis on patients' social behaviour and their ability to adapt to changing situations. However, following recovery of physical function and activities of daily living, a person can still experience difficulties in reintegrating into the community due to behavioural and emotional changes. Traditional behaviour modification techniques can be useful for people with brain injury (Wood, 1992), addressing inappropriate social behaviour, attention and motivation, lack of awareness, memory, language and motor disturbance

(McGlynn, 1990). Individualised behavioural interventions can be applied after thorough assessment, and aim to increase or decrease particular behaviours (Corrigan & Bach, 2005). While generalisation to daily situations can form a persistent problem, even those with severe cognitive deficits can learn new skills that significantly alter behaviour (McGlynn, 1990). When an injured person displays severe behavioural dyscontrol, an environmental neuro-psychosocial approach, that focuses on creating a protective and enabling environment, can assist in returning the person to the community (Karol, 2003).

### **Cognitive Rehabilitation**

Cognitive rehabilitation attempts to improve aspects of a person's functional and integrative performance, where this is impaired by cognitive deficit (NIH Consensus Conference, 1999; Sohlberg & Mateer, 2001; Szekeres et al., 1987; Ylvisaker & Szekeres, 1998). Restorative training focuses on improving a specific cognitive function, whereas compensatory training focuses on adapting to a deficit (NIH Consensus Conference, 1999). Strategy training emphasising compensation for residual cognitive deficits has been shown to be effective for rehabilitation of attention, memory and executive function after TBI (Cicerone et al., 2005). Once areas of cognitive strength and weakness have been identified, referrals can be made to appropriate rehabilitation professionals (Klimczak et al., 1997; Sherer & Novack, 2003) to assist in learning compensation techniques or new ways of doing things (Ylvisaker et al., 1987).

Compensatory techniques that focus on the use of external methods such as cue cards, watch alarms, diaries, address books, and computers to record notes, thoughts and other data, can be used to address a number of cognitive deficits (Chester, Henry, & Tarquino, 1998; NIH Consensus Conference, 1999; Prigatano et al., 1986). Internal strategies can involve self-instructional routines that regulate behaviour using inner speech. Self-instructional routines can help with memory training and with attentional deficits by helping to maintain focus on specific tasks (Sohlberg & Mateer, 2001). A person with executive function deficits may demonstrate inappropriate social and work behaviours, particularly when they are in an unfamiliar environment or engaged in activities that are not routine (Ylvisaker et al., 1987). Self-instructional techniques can help with initiating actions, planning, and problem solving (Sohlberg & Mateer, 2001). With

complex cognitive impairments, applying compensatory strategies in functional situations forms an important part of cognitive rehabilitation (Cicerone et al., 2000).

### **Awareness Issues**

Choice of intervention methods for rehabilitation is influenced by how much a person knows about his or her disability and by whether any lack of awareness reflects psychological denial (Prigatano et al., 1986). Using a direct confrontational approach to treatment when a person denies impairment can be counterproductive as this may result in hostility or catastrophic reactions. By gradually exposing a person to functional activities and allowing him or her to make mistakes in day to day settings, a therapist can provide a supportive but realistic process for promoting an increase in awareness (Butler & Satz, 1988; Prigatano, 1989a).

### **Interventions for Disordered Self-Awareness**

Persistent denial following brain injury can hinder adjustment and the development of coping strategies (Ownsworth, Clare, & Morris, 2006). Psychotherapy that emphasises a shared conceptualisation of problems and provides objective feedback through checklists and behavioural observation can assist with a person's capacity for self observation. Using community-based activities that place the person in real-life activities can transfer control from therapist to the person with TBI, thereby increasing compliance and reducing emotional distress (Cicerone, 1989; Cicerone & Fraser, 2000). People with neurologically-based awareness deficits may increasingly acknowledge these deficits when provided with objective feedback, whereas those whose lack of awareness represents a protective emotional response may demonstrate an increased resistance to acknowledging limitations (Cicerone & Fraser, 2000).

Feedback on progress can be provided through computers (Deaton, 1986), videotaping, supervised activities or community outings, and group therapy, in which peers provide each other with feedback. While self awareness is a critical component of rehabilitation in promoting acceptance of new realities (Prigatano, 1988, 1992a), an increase in awareness of deficits may lead to an increase in psychological distress. Fann and

colleagues (1995) note that awareness of deficit, as opposed to severity of deficit, may be an important factor in delayed-onset depression in people with TBI.

## **Adapting Psychotherapy for People with TBI.**

### **Problems Working with People with TBI:**

As some of the cognitive impairments that result from brain injury can be detrimental to the process of psychotherapy, therapists need a great deal of patience (Pollack, 1994). People with TBI may demonstrate a lack of flexibility, with difficulty in understanding the purpose of therapy, have reduced concentration in sessions, poor memory for what has occurred in previous sessions and problems taking part in a relationship reliant on processing verbal information (Leber & Jenkins, 1996).

Memory impairment can impact on the therapy process in a number of ways. It has been found to be a significant challenge to forming a working alliance (Judd & Wilson, 2005). Frontal lobe lesions can result in impaired memory for personal experience, impacting on the therapeutic relationship (Lewis, 1991). Temporal lobe lesions can lead to impaired memory for factual materials, reducing the person's capacity to remember the content of sessions and the meaning of interpretive comments made during therapy. Short-term memory problems also may be mistaken for resistance in the setting of a traditional psychotherapeutic relationship (O'Shanick & O'Shanick, 1994).

TBI can impact on many aspects of communication ability, including the ability to process and produce coherent discourse. Care is needed to ensure that auditory problems (O'Shanick & O'Shanick, 1994), problems with distractibility and fatigue (Pollack, 1994), and difficulties with word finding and expressive fluency (Butler & Satz, 1988) do not interfere with the therapeutic process. It can be useful to allow extra time to ensure that ideas and strategies have been clearly understood.

A person who has had a significant brain injury may limit both the range of his or her activities and the environments in which these are carried out, in order to keep them manageable (Pollack, 2005). Catastrophic reactions have been observed following brain

injury (Goldstein, 1952, cited in Miller, (1991)). This can happen when the individual is overwhelmed by situational demands. Reactions can range from those that are explosive – screaming, lashing out, throwing things – to more subtle and more easily overlooked behaviours, such as withdrawal, regressive behaviour, hostility to caregivers, and refusal to take part in self-care. Preventing a catastrophic reaction is of prime importance as people with TBI may find it difficult to regain their equilibrium once it has been disturbed (Pollack, 1994).

### **The Therapeutic Alliance**

While cognitive deficits can challenge the process of establishing a working alliance (Judd & Wilson, 2005), developing a collaborative approach is essential to engaging the person in therapy (Khan-Bourne & Brown, 2003). A therapeutic relationship is characterised by trust, warmth, acceptance and human wisdom (Lambert & Bergin, 1994; Leber & Jenkins, 1996). People with TBI must be able to trust that the therapist believes in their distress. Irrespective of cognitive abilities, it is argued that a person will sense true empathy (Sherwin & O'Shanick, 1998). A positive therapeutic alliance can help a person with TBI to clarify reality, challenge denial, set realistic goals and work constructively towards these goals (Miller, 1991). The working relationship can extend beyond the therapist and client to include families and caregivers in order to achieve the best possible outcome from rehabilitation (Prigatano & Ben-Yishay, 1999). It may be necessary to allocate a greater amount of time to developing the working alliance with both the person with TBI and his or her family, emphasising the long-term nature of neuropsychological rehabilitation (Judd & Wilson, 2005).

### **Approach to Psychotherapy with People with TBI:**

A flexible approach is required to psychotherapy with people with TBI, in order to facilitate engagement. This can involve altering the frequency and length of sessions, and the total length of therapy (Pollack, 2005), depending on the impact of cognitive impairment. Fatigue can worsen problems with concentration, communication and memory. Some sessions may need to be considerably shortened, if the person cannot attend for the full traditional 50 minutes. Communication needs to be clear and direct. The use of memory aids such as written summaries and visual cues can help address the

challenge of impaired memory (Judd & Wilson, 2005). Providing regular summaries, and ensuring that the person either makes or is provided with a written summary of what has happened during the session and any tasks to be completed between sessions can help maintain continuity across and between sessions.

People with TBI can easily become overwhelmed when their physical, cognitive and emotional capacities are challenged and may respond in an apparently extreme fashion. Psychotherapy allows for an opportunity to discuss feelings about brain injury, and the various “losses” incurred as a result. The strong emotional component of these discussions may be challenging for people with cognitive impairments or difficulties with self control (Prigatano & Ben-Yishay, 1999) and may lead to a catastrophic reaction. Therapists can overestimate the person’s cognitive and personality resources. People with brain injury may benefit from learning about the catastrophic reaction, which may follow failure in some activity. Feelings of being overwhelmed can lead the person to withdraw and become suspicious of others, adding to his or her sense of loneliness and isolation. This reaction can decrease as the person’s confusion lessens and he or she resumes former activities. Introducing new tasks and concepts gradually in as simple a form as possible can help prevent catastrophic conditions (Pollack, 2005).

Including the family of people with TBI is useful as the consequences of the injury can have considerable impact on family dynamics. An initial step can be to share neuropsychological test findings (Prigatano & Klonoff, 1988) and to provide educational material related to the person’s injury. Families can help with initial interviews, with identifying and prioritising goals, and with monitoring progress (Sohlberg & Mateer, 2001) over the course of rehabilitation. It may be productive to work with groups of relatives (Lauer-Listhaus, 1991; Prigatano & Klonoff, 1988), or to provide family therapy (Miller, 1993; Prigatano & Klonoff, 1988). Families struggle to re-establish stability in the same way that the injured person struggles with the process of rehabilitation (Cavallo & Kay, 2005). Family interventions are crucial if the family is to provide the ongoing support necessary to complement the rehabilitation process.

As emotional and motivational factors are critical for people with TBI, it is important to demonstrate a caring and empathic attitude (Cicerone, 1989), accepting the person for

who they are. It can be helpful to talk about the multiple losses that have occurred since the injury, and to recognise the anger and frustration that are associated with these losses. The injured person can be assisted to activate coping mechanisms that have been used with previous losses. Psychotherapy should be guided by what the person believes to be relevant (Pollack, 1994). Becoming aware of strengths and weaknesses can assist with rebuilding a sense of self and setting achievable goals for the future. In order to re-establish a sense of self, both the therapist and injured person may need to accept a reasonable level of risk-taking and the occasional failure in order to make progress towards achieving these goals.

### **Psychotherapy Interventions**

Rehabilitation also needs to increase self-efficacy and the ability to handle emotional responses (Mateer et al., 2005). Psychotherapy can assist the person to re-establish a sense of self following injury (Pollack, 2005). A range of psychotherapeutic approaches have been described for people with brain injury, including behavioural, cognitive, cognitive-behavioural, psychodynamic and existential approaches. Cognitive-behavioural approaches (Klimczak et al., 1997; Mittenberg, Tremont, Zielinski, Fichera, & Rayls, 1996; Williams, Evans, & Fleminger, 2003) may be appropriate for people with TBI as they are structured, goal-directed, individualised, and involve learning, practice, and social contact (NIH Consensus Conference, 1999). Other psychotherapeutic approaches, including existential (Nadell, 1991), holistic (Leaf, 1991) and educational (Mittenberg et al., 1996; Persinger, 1993) interventions have also been described for clients who have sustained a TBI.

### **Behavioural and Cognitive Behavioural Interventions:**

Behavioural approaches can include behaviour modification techniques and skills training that addresses personality and behavioural effects from TBI (Corrigan & Bach, 2005; NIH Consensus Conference, 1999). These techniques may also be incorporated within a Cognitive Behavioural Therapy (CBT) approach. The cognitive approach to psychopathology regards the processing of external events as biased which distorts the individual's evaluation of experience which leads to a variety of cognitive errors, for

example, over-generalisation, selective abstraction and personalisation (Beck, 2005). CBT aims to identify the underlying distorted beliefs that have been incorporated into enduring schemas or core belief systems. This is achieved by the client using records to identify negative automatic thought patterns, and conditional and core beliefs. CBT has a structured and directive nature that may be appropriate for working with brain-injured patients (Cicerone, 1989; Khan-Bourne & Brown, 2003), by assisting in the identification of extreme and unrealistic beliefs (Sohlberg & Mateer, 2001). Behavioural techniques can be used in the early stages of therapy as people with brain injury often operate at a very concrete level (Pollack, 1994), while cognitive techniques help to identify the person's beliefs about their current situation and abilities. CBT aims to break the negative cycles that maintain depression following brain injury (Khan-Bourne & Brown, 2003), identifying maladaptive strategies, and promoting more adaptive behaviours. CBT for anxiety disorders can encourage the person to identify triggers, focus on environmental control, pace and structure their activities, and promote adjustment to altered functions and roles (Newburn, 1998). Management of anger outbursts following TBI can be achieved through the use of highly structured behavioural and cognitive techniques (Delmonico et al., 1998), and by learning to identify and manage anger-evoking events (Miller, 1991). Following TBI, reduced control over mood shifts and impulsive behaviour may impact on a person's sexuality. CBT provided in individual or group format can help to improve sexual and interpersonal functioning (Dombrowski, Petrick, & Strauss, 2000).

### **Other Psychotherapeutic Interventions:**

Psychotherapy following TBI can also utilise approaches that focus on existential concerns, relationship processes and personal growth, with a focus on adapting psychotherapy to the unique needs of the individual (Leaf, 1991; Nadell, 1991). Dynamically oriented psychotherapies relying on interpretative statements to develop insight, may also be used in a supportive context. Tentative interpretations can be used to make explicit connections that are not available to the person with TBI and may need to be repeated often (Barry & O'Leary, 1989; Pollack, 1994). Dynamic interpretations should not be ascribed to behavioural symptoms that have an organic cause (Butler & Satz, 1988). Obtaining a complete pre-morbid and current history, involving interviews



with family and caregivers can assist in forming individual diagnoses and conceptualisations.

### **Education:**

An educational component, focusing on the type of damage that can occur to the brain and how this can influence thinking and behaviour can be useful in the early stages of psychotherapy (Cicerone & Fraser, 2000; Prigatano et al., 1986; Szekeres et al., 1987). Simply understanding their symptoms and learning that these symptoms are normal consequences of head injury can be extremely beneficial (Miller, 1991). Education can be of benefit to both patient and carers (Khan-Bourne & Brown, 2003; Lauer-Listhaus, 1991; Mittenberg et al., 1996), with knowledge reducing anxiety and encouraging the use of adaptive strategies (Leber & Jenkins, 1996; Persinger, 1993).

### **Empirical Studies**

The aims of psychotherapy research include understanding the various forms of treatment, the way in which these treatments operate, the impact of treatment on psychological functioning, and developing and evaluating treatments that can be used in clinical practice (Kazdin, 1994). Research on psychotherapy for people with brain injury can investigate the processes of adjusting to the needs, limitations, deficits and strengths (Kinney, 2001) of the people who are the potential recipients of therapy.

### **Studies of Psychotherapy for Patients with TBI.**

There have been few empirical studies (Coetzer, 2007; Leber & Jenkins, 1996) that have aimed to demonstrate the effectiveness of psychotherapy for people with TBI. This still appears to be the case, with predominantly small studies reported in the literature, possibly due to the difficulties involved in conducting large clinical trials with this population. Prigatano and colleagues (1984; 1994) conducted controlled outcome studies in which they investigated the outcomes of their rehabilitation programs, which included psychotherapeutic components. Mittenberg, Tremont, Zielinski, Fichera and Rayls (1996) conducted a controlled group study investigating the effectiveness of Cognitive Behavioural Therapy for the prevention of post-concussion syndrome. Delmonico and colleagues (1998) have described a group treatment therapy for persons

with TBI, which focuses on management of frustration and substance abuse. Lauer-Listhaus (1991) reports on psycho-educational group therapy developed to assist families of head injured adults in addressing adjustment issues associated with TBI. Several authors have described case studies (Alderman, 2003; Klimczak et al., 1997; Leaf, 1991; Lewis, 1991; Nadell, 1991; Williams et al., 2003). Persinger (1993) compared therapy with patients sustaining closed head injury with a reference group who had sustained chronic dysfunction due to spinal, peripheral vascular complications. The characteristics and outcomes of these studies are summarised in Table 3.1, pp. 49 – 53.

Alderman (2003) described two case studies of psychotherapy with patients with problems of irritability and aggression following motor vehicle accidents. Both studies described psychotherapy with males with very severe TBI. In the first case study, a CBT approach was used to address problems with irritability and aggression that had led to difficulty with placing the patient in the community or family home. Over the course of therapy, the incidence of aggressive episodes decreased to the point where the patient was able to be transferred to an open ward. In the second case study, a behaviour modification approach was used to reduce episodes of shouting and aggression that presented difficulties for staff in assisting the patient with washing and dressing. Following a reduction in the frequency of shouting, the patient was able to participate fully in his rehabilitation programme.

Klimczak and colleagues (1997) described psychotherapy with a 27-year-old male who had sustained head injuries in two separate car accidents, at ages 21 and 25. Psychotherapy provided a rationale for symptoms and emphasised setting small manageable goals, including compensating for deficits, improving interpersonal competence, accessing services and focusing on self acceptance and realistic hope for the future. Limitations of this study included the lack of a control and not forming operational definitions for the goals of therapy in a manner that allowed for measurement.

Leaf (1991) discussed an holistic Adlerian approach to psychotherapy, emphasising the process of recovery from brain injury, and the person's ability to establish, maintain and grow in personal relationships. He noted that many people with TBI are risk takers,

impulsive and socially awkward and may have had difficulty in establishing relationships prior to injury. Two case studies were discussed in this article. Methodological limitations included the lack of controls or mention of outcome measurements.

Nadell (1991) suggested that a psycho-existential approach to psychotherapy focusing on the impact of life events can help reconstruct a viable sense of meaning following TBI, with recognition of loss and a gentle confrontation of distorted ideas about the qualities of the changed person and his or her relationship with the world. He outlined a case study describing the impact of existential psychotherapy with a person with TBI, noting that the devastating impact of TBI can force a person to come to grips with mortality in a sudden and radical fashion. While psychological testing was conducted prior to intervention, these measures were not repeated following the intervention and the design did not include a control.

Williams and colleagues (2003) described a case study of a man who had a dense amnesic disorder following TBI and also Obsessive-Compulsive Disorder (OCD). Treatment consisted of a combination of CBT for anxiety features and cognitive rehabilitation for memory difficulties. The study compared measurements taken pre- and post-treatment. The patient reported increased confidence in incorporating compensatory strategies into his everyday life.

While each of these reports of case studies provides discussions and illustrations of the particular approach to psychotherapy, some of the studies did not include controls. In these cases, improvements could have occurred without the interventions due to the natural recovery process. Single-case experimental designs can help to determine whether improvement is a result of treatment, or of some other cause such as passage of time (Wilson, 1991).

Mittenberg and colleagues (1996) conducted a study with people who had sustained a Mild Traumatic Brain Injury (MTBI) with no medically significant extra-cranial injuries. Participants were randomly assigned to either a treatment or control group. Those in the treatment group received a manual outlining recovery from head injury, met with a therapist to review the nature of symptoms, a model of maintenance for

treatment, techniques for reducing symptoms, and receive instructions around gradual resumption of activities. Those in the control group received routine hospital treatment and written discharge instructions. Improved outcomes for the treatment group suggested that brief early psychological intervention can reduce the incidence of Post-Concussion Syndrome (PCS).

Persinger (1993) investigated personality changes following brain injury as a grief response to the loss of sense of self. The treatment group was compared with a reference group of those with chronic dysfunction due to spinal and vascular complications. Provision was made for verbal feedback about the process of treatment. Two thirds of CHI patients and two reference patients reported positive changes. Differences between the patient group and reference group were described, but were not analysed using statistical methods.

Prigatano and colleagues (1984) conducted a controlled study in which people with TBI completing a Neuro-behavioural Rehabilitation Programme (NRP) were compared with those who had been unable to take part in NRP. The NRP included a psychotherapeutic component in order to maximise eventual psychosocial recovery. Participants involved in the NRP showed better neuropsychological test functioning and personality functioning on follow-up, than did the control participants. The authors concluded that a successful outcome appeared to be a result of a combination of factors. These included the type and severity of brain injury, the premorbid characteristics of the participants, the skill and dedication of therapists and local social and economic conditions, which determine whether or not gainful employment was a practical goal.

Prigatano and colleagues (1994) conducted a further study in which participants with TBI who underwent a milieu rehabilitation programme were compared to an historical control group of TBI participants who did not receive this type of rehabilitation. Individual psychotherapy and daily group psychotherapy formed part of this programme. The programme included a protected work trial. Productivity was greater for those in the milieu programme. These two studies (Prigatano et al., 1984; Prigatano et al., 1994) have used clearly defined measures in order to compare the functioning of participant groups before and after intervention. These measures have also allowed for

the comparison of the treatment groups with control groups. In both cases, psychotherapeutic intervention formed part of an overall rehabilitation programme. While the efficacy of these programmes has been investigated, the effectiveness of psychotherapy as such, has not been separated from other aspects of the programme.

The efficacy of group therapy has been investigated with a TBI population (Delmonico et al., 1998) and with families of head-injured adults (Lauer-Listhaus, 1991). Neither of these studies used a control or comparison group. Delmonico and colleagues (1998) described a group psychotherapy model used within a comprehensive rehabilitation centre. The groups focused on treatment of substance abuse and frustration management through education, social support, and development of interpersonal skills. Outcome measures were not discussed in the report, although it was noted that some group members had been sober for more than five years. Lauer-Listhaus (1991) provided an outline of a supportive group therapy which was conducted in conjunction with a six month Day Treatment Cognitive Rehabilitation Programme. The measure used to assess the efficacy of this programme was an open-ended questionnaire, completed by each participant at the conclusion of the group sessions. The authors recommended that psycho-educational groups be provided for families participating in similar programmes since it was considered that stable and supportive families were critical in providing the impetus for increased success of rehabilitation programme participants.

Table 3. 1

*Methodological Characteristics of Studies of Psychotherapy with Brain-Injured Clients.*

Study	Brain Injury Criteria	Design	Source of Participants	Type of Psychotherapy	Number of Participants	Follow-up Sessions	Measures Used	Outcome
Alderman, N. (2003)	Case 1: Severe TBI sustained in a road traffic accident.	Single-case AB time-series design.	Locked ward in specialised rehabilitation service.	CBT aimed at reducing irritability and aggression.	N = 1	Recordings continued after discharge to open ward.	Staff / participant recordings of aggressive behaviour.	Transfer after 22 sessions to open pre-community discharge unit.
	Case 2: Severe TBI with multiple injuries sustained in a road traffic accident.	Time-series design.	Neuro-rehabilitation unit.	Behaviour modification therapies with DRL programme.	N = 1	Follow-up at 6, 20, 36, 60, 100, 144 weeks after completion of DRL.	Frequency of shouting while engaged in washing and dressing.	Increased behavioural control and functional independence for patient with hygiene and physiotherapy.
Delmonico, R.L., Hanley-Peterson, P., & Englander, J. (1998).	TBI.	Report on programme for individuals with a TBI, who have problems with frustration and substance abuse.	Santa Clara Valley Medical Centre, San Jose, California.	Group psychotherapy, with cognitive-behavioural approaches involving coping strategies, modelling, behavioural rehearsal, self-monitoring, and peer reinforcement.	Open groups – members move in and out of the group situation. No numbers were given in the report.	Ongoing communication was maintained with group members. One member was quoted as having been sober for 4 years.	No measures were discussed in the report. Evidence was of an anecdotal nature.	For both the anger and substance abuse groups, no outcome data was reported. However, both groups were described as successful in addressing problems of anger / substance abuse in a TBI population.

Study	Brain Injury Criteria	Design	Source of Participants	Type of Psychotherapy	Number of Participants	Follow-up Sessions	Measures Used	Outcome
Klimczak, N.J., Donovick, P.J., & Burright, P. (1997).	Client had sustained two brain injuries in car accidents: Age 21, multiple traumas, with coma length 3 weeks; Age 25, LOC, less than one hour.	Single subject case study. Neuropsychological profile provided. Outcome measures not discussed.	Authors affiliated with Environmental Neuropsychology Laboratory, Dept. of Psychology, State University of New York at Binghamton.	Goals of treatment: Cognitive-behavioural strategies aimed at increasing patient's ability to recognise and compensate for deficits.	One participant.	Not discussed in this article.	Neuro-psychological profile: K-BIT scales; G.D.S. scales; F.A.S. scales; Rey Complex figure scales; C.V.L.T. scales.	Identification and acceptance of cognitive and psycho-social deficits resulted in the patient being more amenable taking part in psychotherapy to address these issues.
Lauer-Listhaus, B. (1991).	Males and females (19-59 years) who sustained focal or diffuse head injury from a period of 6 months to 15 years prior to the programme.	Report on programme for families of head-injured adults. Case study. No control or comparison group.	Caregivers of 16 head-injured adults taking part in day treatment rehabilitation programme: International Centre for the Disabled, New York, USA.	Psycho-educational group approach: - provides families with information, emotional support and ongoing crisis intervention.	16 head-injured adults; 16 caregivers.	Completion of questionnaires at conclusion of group sessions.	Open-ended questionnaire.	Families and group leaders provided favourable feedback. Families reported increased awareness of own needs and some requested ongoing therapy.
Leaf, L.E. (1991).	Case 1: Severe closed head injury; unconscious and intoxicated at time of injury. Case 2: Closed head injury, length of coma –	Two case study reports. No controls.	Author is neuro-psychologist administrator; Meadowbrook, Los Angeles; Community Re-entry Services.	Adlerian theoretical approach: Therapy takes a holistic perspective and helps to move the person towards a sense	Two case studies are discussed in this report.	Case 1: One follow-up was reported following completion of therapy. Case 2: Follow-up occurred one year after	Measures in the form of psychological testing were not discussed in the report.	Case 1: Client had returned to school part-time, maintained sobriety, and was adjusting well. Case 2: Client still living at home, taking a class in

Study	Brain Injury Criteria	Design	Source of Participants	Type of Psychotherapy	Number of Participants	Follow-up Sessions	Measures Used	Outcome
	6 weeks.			of self and awareness.		completion of therapy.		college, looking for a job, and involved with support groups.
Mittenberg, W., Tremont, G., Zielinski, R. E., Fichera, S., & Rayls, K. R. (1996).	GCS scores not below 13 at admission; PTA not exceeding 24 hours.	Randomised controlled study	Study in cooperation with Broward General Medical Center Trauma Services.	Information and therapy outlining and assisting with recovery from Head Injury	N = 29 in each of treatment and control groups.	Participants were interviewed 6 months after their injury.	Interviews using a structured PCS symptom list with respect to frequency, intensity and duration.	Treated participants reported fewer symptoms and significantly shorter symptom duration
Nadell, J. (1991).	Single case study. TBI resulting in various areas of haemorrhage; multiple orthopaedic injuries.	Single subject case study. No controls.	Author is Staff Psychologist at Healthsouth Regional Rehabilitation Centre, Miami, Florida, USA.	Existential Psychotherapy: exploration of inevitability of death; creation of new sources of life meaning, commitment to rehabilitation process.	One participant.	No reported follow-up sessions.	TAT; Rotter Adult Sentence Completion; BDI.	Client has a commitment to rehabilitation process; has tapped feelings of connectedness to family; has identified manageable goals for the future.
Persinger, M.A. (1993).	Adults with CHI: - damage to the frontal, temporo-frontal and superior parietal lobes. Mild – 30%; moderate – 50%; severe – 20%; Reitan-Halstead indices.	Comparison of a treatment group with a reference group who had experienced chronic dysfunction due to spinal, peripheral vascular complications.	Clients referred for assessment to Department of Psychology Behavioural Neuroscience Laboratory, Laurentian University, Sudbury, Ontario, Canada.	Therapy had an education basis aiming to provide cognitive structure for client's phenomenological experiences.	Treatment group: 56 adults (33 men, 23 women). Reference group: 17 adults (10 men, 7 women).	Telephone logs registered calls from clients. 1-3 months following treatment, results of assessment and recommendations were shared with the client and family.	WAIS-R; MMPI. Feedback (written and verbal form) from client and reference groups. No feedback was received from the reference group.	52% of CHI patients only reported appreciation. Two thirds of CHI patients and 2 reference patients reported significant and positive change in their subjective experiences.



Study	Brain Injury Criteria	Design	Source of Participants	Type of Psychotherapy	Number of Participants	Follow-up Sessions	Measures Used	Outcome
Prigatano, G.P., Fordyce, D.J., Zeiner, HK., Roueche, J.R., Pepping, M., & Wood, B. (1984).	Significant traumatic head injury; cerebral contusions &/ or brain stem contusions.  Past period of spontaneous recovery.	Experimental design; treatment group: 18 TBI patients completing NRP.  Control group: 17 patients unable to take part in NRP.	Presbyterian Hospital, Oklahoma City, Oklahoma.	Therapy is part of NRP. Major themes include awareness and acceptance of injury; cognitive retraining; compensatory skills; understanding of emotional/ motivational issues.	Treatment group: 18 participants;  Control group: 17 participants.	Intake to programme; Feb., 1980 – Aug., 1982.  Follow-up – Apr. – May, 1983.	WAIS-R; WMS; Trail Making Test; Finger Tapping Test; Tactual Performance Test of HRB; Russell-Neurenger AIR.; KAS-R.	Improvement in neuro-psychological status and reduction in emotional distress for those in the NRP, leading to improved psychosocial adjustment and eventual gainful employment.
Prigatano, G.P., Klonoff, P.S., O'Brien, K.P., Altman, I.M., Amin, K., Chiapello, D., Shepard, J., Cunningham, M., & Mora, M (1994).	At least 15 months since the injury; diagnosis of TBI;  Potential to return to gainful employment;  Significant brain injury according to GCS score and neuro-radiographic findings.	Experimental design;  Treatment group (part of a rehabilitation programme), compared to an 'historical control' group (patients prior to development of programme).	Patients at BNI at St Joseph's Hospital and Medical Centre, Phoenix, Arizona.  Patients at BNI, prior to introduction of rehabilitation programme.	Neuropsychologically oriented milieu rehabilitation programme, including individual and group psychotherapy, along with physical, occupational, speech and language, and cognitive therapies.	Treatment group: 38 participants;  Control group: 38 participants.	Injury follow-up interval (months):  Treatment group Mean = 43.26 SD = 16.1.  Control group: Mean = 33.50 SD = 8.7.	Productivity status of patient:  Productive – (working full-time or part-time, or involved in volunteer work); unproductive – (unable to work, looking for work, homemaker, retired, other).	Patients who underwent the neuropsychologically oriented milieu programme were more productive than historical controls not undergoing this form of care.

Study	Brain Injury Criteria	Design	Source of Participants	Type of Psychotherapy	Number of Participants	Follow-up Sessions	Measures Used	Outcome
Williams, W. H. Evans, J. J. & Fleminger, S. (2003).	TBI in road traffic accident. Coma of 4 weeks, PTA of 2-3 months.	Single-case AB design	Centre for cognitive rehabilitation.	CBT and neuro-rehabilitation for OCD and health anxiety.	N = 1	6-month review.	HADS; MOCI	Reduced scores on HADS and MOCI; increased confidence in integrating skills to achieve goals

**Note:** ADHD = attention deficit hyperactivity disorder; AIR = average impairment rating; BDI = Beck Depression Inventory; BNI = Barrow Neurological Institute; CHI = closed head injury; CVLT = California Verbal Learning Test; DRL = Differential Reinforcement; FAS = Controlled Oral Word Association Test; GCS = Glasgow Coma Scale; GDS = Gordon Diagnostic System; HADS = Hospital Anxiety and Depression Scale; HRB = Halstead Reitan Battery; IQ = Intelligence Quotient; KAS-R = Katz Adjustment Scale: Relative's form; K-BIT = Kaufman Brief Intelligence Test; LOC = Loss of Consciousness; MMPI = Minnesota Multiphasic Personality Inventory; MOCI = Maudsley Obsessive-Compulsive Inventory; SD = standard deviation; TAT = Thematic Apperception Test; TBI = traumatic brain injury; NRP = neurobehavioural rehabilitation programme; WAIS-R = Wechsler Adult Intelligence Scale-Revised; WMS = Wechsler Memory Scale.

## **Methodological Issues with Psychotherapy Research**

One goal of psychotherapy research is to develop and evaluate treatments that can be used in clinical practice (Kazdin, 1994). Commonly used research designs include group designs, single-group studies and single case research. Group designs where participants are randomly allocated among psychotherapy treatment conditions allow for evaluation of any differences that may arise that are assumed to result from the different treatment conditions. Single case studies or multiple-baseline designs allow for research that may be interpreted at an individual level.

### **Group designs**

The most commonly used group research designs are the pretest-posttest control approach (Kazdin, 1994). This commonly involves comparison between treatment and no-treatment or wait-list control groups, with measurements taken before and after the intervention. This design controls for threats to internal validity, where participants are randomly assigned to treatment and control groups (Kazdin, 2003). Where random assignment between group conditions is not possible, quasi-experimental designs may be used, where the progress of treatment and non-treatment groups are followed over time. The strength of these designs depends on the similarity between groups.

Criticisms of the use of control groups in psychotherapy research include the ethical problem of depriving people of treatment and the practical problems of keeping no-treatment people in the study and away from other forms of assistance (Basham, 1986). When providing clinical treatment services, it is often impractical, if not impossible to assign people to treatment or non-treatment groups (Prigatano et al., 1994).

In neuropsychological and psychotherapeutic research, group designs can be limited by the availability of appropriate participants. Adequate sample sizes and appropriate control groups can be difficult to achieve in a clinical rehabilitation environment (NIH Consensus Conference, 1999), with a low frequency of participants with conditions that are relevant to the questions raised (Lezak & Gray, 1991).

### **Single subject designs**

Small-scale studies using single-case or multiple-baseline designs contribute to our understanding of what constitutes effective treatment (Sohlberg & Mateer, 2001), with valid and generalisable results being obtained from studies of individual patients (Wilson, 1991). Single subject designs avoid the difficulties that arise from the low availability of participants and the need for control groups. With the single subject design, the participant may act as his or her own control. Single-case research can be viewed as *intra-subject* research (Hilliard, 1993), which focuses on taking measurements across time on selected variables for a single participant. This allows for examination of the relationships between variables of interest across the different phases of psychotherapy. The issue of lack of generality that arises from single case studies can be addressed by replicating the treatment on a case-by-case basis. Single-case designs have been used to illustrate the effectiveness of cognitive therapy in targeting relapse in psychosis (Gumley & Power, 2000) and CBT for adolescents with psychosis (Wragg & Whitehead, 2004). In Clinical Psychology, there is an intense focus on the individual, with the detailed description entailed in case studies reflecting the multiple levels and influences that are in operation for the client (Kazdin, 2003). While case studies may not provide strong causal knowledge, they can demonstrate the efficacy of clinical interventions. Single case experimental designs look at the effects of an intervention on dependent measures for the individual as compared to baseline conditions before intervention is implemented.

Multiple-baseline designs can be useful as evaluative procedures. One variation of this design is the multiple-baseline across participants' design. While multiple participants are involved in this design, the methodology has similarities to single case-methodology in that small groups of participants are involved and results are meaningful at the individual level. Multiple baseline across participants' studies use separate baseline/intervention designs for each of two or more participants for a particular variable in a particular setting (Sarafino, 2005). The effect of the intervention is compared to baseline conditions for each participant. The assumption is that the only participant whose dependent measures change at any one time is the participant receiving the intervention, allowing the inference that it is the intervention techniques that cause the change.

### **Ethical issues**

Key ethical issues arising in conducting research on the effectiveness of psychotherapy for people with TBI arise around the ability of potential participants to provide consent to take part in both rehabilitation procedures and research, and around safety concerns. Brain injuries typically result in compromise of cognitive function, raising ethical issues around the issue of competency to consent (Fowles & Fox, 1995). When a person has a severe degree of incapacity, it may be necessary to approach a legally authorised guardian (Knight & Linscott, 2000) in order to obtain consent for rehabilitation procedures or for research, following obtaining assent from the potential participant. Problems may arise where there is conflict arising due to alienation or minimal contact with family members. Safety for participants forms an ongoing ethical concern. People with TBI who suffer from depression and/or other psychological disorders need to be monitored carefully. Where the person with TBI is at risk of depression, the possibility of suicide needs to be under constant review, with a focus on cognitive capabilities and personality (Leon-Carrion et al., 2001).

### **Summary**

Conducting research into psychotherapy for people with TBI presents a number of issues for consideration. There may be difficulty in obtaining sufficient participants to conduct large scale clinical trials. People with TBI may present with varying cognitive abilities. There may be impairments in self-awareness, abstract thinking, the ability to self-monitor, in memory and attentional capacities, and in the ability to transfer new skills to practical situations (Pollack, 2005). In studies of comprehensive rehabilitation programmes (Prigatano et al., 1984; Prigatano et al., 1994), psychotherapy has been a component in an overall programme and not studied in isolation. There may be ethical concerns in using wait-list or no treatment control groups, and in obtaining consent from potential participants with TBI who have limited understanding of the processes involved. Treatment needs to be individualised and adapted to the unique needs of participants. Finally, designs with small numbers of participants may be more appropriate for this research, while lacking the statistical power of large group designs.

## **Research Approach for This Study**

The aim of this study is to evaluate the effectiveness of Cognitive Behavioural Therapy (CBT) that is adapted for people with TBI using a sound methodological approach. The Cognitive approach to psychotherapy focuses on clients' processing of external and internal events which can be biased in a manner that leads to cognitive distortions (Beck 2005), for example, personalising the actions of others. In CBT a number of techniques are used to identify underlying belief structures that promote these biased perceptions. These include discussing the Five Part Model which discusses the interaction between cognitions, emotions, behaviours, biology and the environment; using Thought Records to identify Negative Automatic Thoughts; and using questioning to identify assumptions and core beliefs. These techniques have been described by a number of authors, including Beck (1995). CBT approaches have been adapted for those with anxiety (Wells, 1997) and depression (Persons et al., 2001). CBT approaches have been used to assist people with TBI in managing irritability (Alderman, 2003) and pain (Tyrer & Lievesley, 2003).

The approach to this research study aimed to consider some difficulties specific to neuropsychological research, in particular the limited availability of participants, and to focus on the contribution of psychotherapy in reducing psychological distress arising from injury.

### **Hypotheses:**

1. Participants would identify and make progress towards personal goals in adjusting to work, study, social and home-based activities following injury.
2. Over the course of therapy, participants will experience a reduction in symptoms of psychological distress.
3. Participants would demonstrate increased awareness of their strengths and weaknesses.
4. Homework assignments will assist participants in making progress across treatment sessions.

## **Chapter 4: Setting up the Research Project**

The review of the literature in Chapter 3 suggests that there is a place for psychotherapy programmes in neuropsychological rehabilitation for clients who have sustained a TBI. However, there have been a limited number of studies conducted in this area. The studies have predominantly utilised single case designs, with some limitations in the methodology of approach due to lack of provision for a control or limited use of appropriate measures. Some studies that have featured group designs have also had some limitations in design with respect to use of outcome measurements (Persinger, 1993) or with the psychotherapy component being part of a much wider programme (Prigatano et al., 1984, Prigatano et al., 1994).

Prior to setting up the current study a number of preliminary steps were considered necessary;

1. To determine the extent of likely psychotherapeutic need in a New Zealand TBI client context, a review of clinical files was undertaken. Files of people with TBI referred to Massey Psychology Clinic, Wellington were reviewed for rehabilitation recommendations following neuropsychological assessment.
2. Development and review of a Manual for Cognitive Behavioural Therapy, adapted for the needs of those with TBI.
3. An initial pilot of this Manual with three clients with TBI referred for psychological assistance.

### **Review of Clients**

The files of 20 people with TBI who had been referred to the Massey University (Wellington) Psychology Clinic, between January and September 2003 were reviewed. Although the sample was small, it was demographically similar to characteristics of TBI individuals reported in the literature. Percentage of males (70%) and causes of injury (motor vehicle accidents, falls, assaults, work related accidents) both closely followed the trends previously reported by Naugle (1990). Ages within the sample ranged from 15 to 88 years, with two noticeable clusters – six (30%) aged between 20 and 27, and nine clients (45%) aged between 40 and 56. The first cluster reflected the

epidemiologic trends of pronounced peak of closed head injuries during the period from adolescence to the mid twenties noted by Kraus and Chu (2005) and Naugle (1990). Two (10%) were aged over 80. Time since injury varied with some encountering persistent difficulties more than 20 years after their injury as has previously been noted in the literature (Hoofien et al., 2001; Thomsen, 1984).

Some 75% of the sample scored in the borderline to low average range in memory and learning, 40% in the areas of attention, information processing speed, and executive function and planning - 15% of clients scored in areas of visuo-perception and visuo-construction, and 15% motor function respectively. These difficulties have also been reported previously, e.g., Millis et al., (2001) who found memory, attention and processing speed difficulties present five years after TBI.

A small number of the current sample (20%) performed at an average to high average level on cognitive tests, despite having sustained a TBI. However, average or above average levels of function may still represent areas of difficulty for these people, depending on their occupation and abilities prior to their injury. Cognitive deficits most likely to be present five years after TBI include areas of memory function, attention and processing speed (Millis et al., 2001), areas required for high demand occupations. For these clients, ongoing support could be indicated in order to facilitate re-entry to the work force.

Symptoms of mood disorder, anxiety, adjustment, psychotic and various other mental health disorders, were found at similar rates as previously reported in the literature (Fann et al., 1995, Naugle, 1990) with the biggest increases in the areas of anxiety and adjustment. In their review of the literature on TBI and substance abuse Parry-Jones, Vaughan and Cox (2006) found that pre-TBI history of alcohol misuse ranged from 37% to 51% and the pre-injury history of illicit drug prevalence was 10% - 44%. A number in this group (45%) had a history of previous psychological disturbance, with 20% having a history of substance abuse prior to injury.

Recommendations from reports in files were broadly in three areas: education about the person's injury and assessment results, learning compensatory strategies to cope with cognitive impairment, and psychotherapy in order to cope with psychological,



psychosocial and adjustment issues arising from injury. Where there was a recommendation for psychotherapy, referrals were made for assistance from a clinical psychologist with experience in the area of brain injury specifically for alleviation of depression and anxiety, management of pain and/or fatigue, stress management, relaxation techniques, acceptance of limitations arising as a result of the injury, extending the person's range of activities, and dealing with past issues of physical and sexual abuse.

After six months the 20 files were revisited in order to determine the extent to which the recommendations had been implemented. Intervention had been provided by a number of clinicians, including Occupational Therapists (independent living skills, driving assessments), Living Skills Coaches, Psychiatrists (further assessment) and Clinical Psychologists (anxiety particularly social anxiety, depression, stress management, and for education about the potential consequences and impact of the injury).

This review supported the use of a psychotherapy programme for those with TBI. A CBT approach was considered appropriate as CBT has demonstrated efficacy with depressive and anxiety conditions such as social anxiety (Persons et al., 2001; Wells, 1997). A directive structured approach was considered appropriate for those who had a concrete style of response following injury. The aim of this programme was to include education around the consequences of TBI and discuss management strategies for minimising the impact of physical and cognitive changes. Cognitive techniques would be used to identify underlying thought processes and assumptions that could lead to cognitive distortions in order to reduce emotional distress arising from anxiety, depression and adjustment difficulties. Additional skills included in the programme promoted decision making and problem solving abilities. The number and structure of sessions would need to be flexible in order to allow for individual variation with the cognitive and physical consequences of the injury, in particular, impairment of memory, attention, language abilities and information processing speed; and fatigue and pain. Educational material would need to be adapted to the reading skills of individual clients. As some clients might not be able to drive, due to cognitive impairments or ongoing experience of seizures, flexibility would be required with the venue for therapy sessions.

### **Inclusion/Exclusion Criteria for Participants in this Study**

Potential participants in this study would need to meet the following criteria:

- The person had sustained a mild, moderate or severe TBI
- The referral was for assistance in psychological, psychosocial and adjustment issues following TBI
- The person was able to take part in predominantly verbal interactions with the therapist

Potential participants were excluded if the following conditions applied:

- Alcohol and drug issues were present
- The person presented with personality or psychotic disorders

### **Cognitive Therapy Manual**

The therapy programme was developed for people with mild, moderate or severe TBI who had adjustment needs following their injury. There was a need for participants to be able to take part in predominantly verbal interactions, although the programme made provision for using alternative methods of expression for those who could interact verbally, but found that other modes of expression allowed for an additional way to express the meaning of their injury (e.g., using art or music). The therapy was not adapted for those who exhibited severe behavioural dyscontrol. Karol (2003) suggests that these people would be better served by a neuro-psychosocial approach that aimed to adapt the environment to the person as opposed to adapting the person to the environment. The therapy was similarly not aimed at those people with TBI who had co-morbid issues such as alcohol and drug problems, personality disorders, or psychotic conditions. These co-morbid conditions were screened for when referrals were presented at Intake Meetings at the Massey University Psychology Clinic, Wellington. Looking at issues of co-morbidity would be a topic for further research.

A manual for a time-limited series of cognitive therapy sessions was prepared allowing for 8-12 sessions, depending on the needs of the individual client.<sup>1</sup> See Appendix 1. p. 151 for the Cognitive Therapy Manual. Adaptations for people with TBI included being flexible about the timing of sessions to allow for issues such as fatigue, memory, attention span, and comprehension of material; providing education around the expected consequences of TBI; using folders to contain session materials; including family members in sessions as appropriate; and encouraging participants to use additional modes such as Art or Music to describe the impact of their injury. The outline of sessions was based partly on well-researched cognitive therapy programmes as described by Beck (1995), Greenberger and Padesky (1995), Persons and colleagues (2001) and Wells (1997). Cognitive therapy uses a record keeping approach to identifying thoughts, behaviours, emotions, biological symptoms and environmental influences in order to understand the origins of the client's psychological difficulties (Greenberger & Padesky, 1995). A number of dysfunctional beliefs (Beck, 2005), such as "If I can't do a task perfectly, I'm a failure" can make individuals vulnerable to depression, anxiety or other psychological disorders when life events such as TBI impact on this vulnerability. Other writings taken into consideration included Prigatano (1991b) who outlined approaches specific to clients who have sustained brain injury, and Davis, Eshelman and McKay (2000) who discussed a comprehensive range of relaxation techniques.

The initial assessment session provides an opportunity for the Clinician to obtain information and to normalise the client's experience following injury, which can assist in providing a sense of hope that it is possible to make progress in working towards recovery. Goals are client centred; these are negotiated in the first two sessions and can be reviewed across treatment. The Activity Schedule provides an opportunity to identify activity levels and determine times when issues such as fatigue, pain and other problem areas are exacerbated. Applied behavioural analysis in Session 2 provides an

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<sup>1</sup> Thanks are due to Vilke of Massey University, Wellington, for sharing the manual prepared for her study on Cognitive Therapy for Adolescents with problems related to substance abuse. This provided ideas for the initial structure of the manual.

opportunity for identifying antecedents and consequences of problematic behaviours, such as anger outbursts resulting from frustration and cognitive challenges.

Cognitive techniques (Thought Records, identifying intermediate and core beliefs) are used throughout the programme in order to address psychological referral issues such as depressive or anxiety symptoms. Additional techniques to address problems arising from TBI include sections on decision making and problem solving skills.

A set of homework summary sheets was available that could be used to remind participants of homework for each week. These gave guidelines for homework, but could be modified as required to suit the needs of each individual. Homework exercises included completing Activity Schedules, Thought Records and Problem Solving Worksheets. A diagram outlining the Five Part Cognitive Model from Greenberger and Padesky (1995) was available.

The manual was submitted to a number of Clinical Psychologists, experienced in cognitive therapy and with knowledge of TBI for advice and comment. These psychologists were selected from clinicians working at Massey University, and other institutions providing psychological services in New Zealand. Adaptations included following this consultation included the addition of a preliminary assessment session in order to establish the therapeutic relationship between participant and therapist, to exclude those with complex presentations such as co-morbid drug and alcohol abuse, include a functional analysis to identify triggers and consequences of problematic behaviours, providing check-in time at the commencement of sessions, incorporating relaxation exercises and allowing time to record homework tasks at the conclusion of sessions.

The manual was structured by session. For each session, the goals and session structure were outlined, along with notes relating to each of these goals. With some sessions, it was noted that the material could take longer to cover than the allocated time of one hour. Sessions were aimed at introducing people with TBI to the cognitive model of symptoms of psychological distress, providing education about the consequences of

TBI, building up motivation for rehabilitation activities, recognising psychological symptoms, learning skills for reducing psychological distress, and working towards independence, relapse prevention and termination of therapy.

It was envisioned that the therapist and participants would work together to negotiate goals for therapy and that each participant would take an active part in the process, working on homework assignments between sessions. It was anticipated that for some participants, planning and completion of homework could be difficult given the prevalence of memory and organisational difficulties following TBI. The progress of each participant would be monitored across the course of treatment sessions. The measures used to monitor therapy outcomes are discussed in Chapter 5.

*Training in Use of CBT Manual:* training in the use of psychotherapy manuals has been regarded as a necessary phase in clinical outcome trials (Crits-Christoph et al., 1998). Generally, studies have established that manual-based training promotes treatment adherence (Miller & Binder, 2002). For this study, the clinicians providing psychotherapy treatment were familiar with the CBT approach, as it is a main approach emphasised at the Clinic, and were also experienced in working with clients with brain injury. Clinicians were provided with the Cognitive Therapy Manual, folders to contain therapy materials, and discussion around the approach to therapy. It was emphasised that while the Cognitive Therapy Manual provided guidelines for therapy, the programme was to be adapted to the requirements of each individual person. Folders provided for clinicians contained the following:

- Cognitive Therapy Manual
- Timetable for administration of measures
- Copies of HADS, PCRS, HRS-II measures
- Homework Sheets
- Education Sheets
- Cognitive Therapy Checklist

The clinicians providing therapy sessions were able to discuss the purpose of sessions and appropriate adjustments for individual participants with the candidate who was the author of the Manual as the need arose.

### **Monitoring Adherence to the CBT Manual**

Miller and Binder (2002) note that treatment fidelity is divided into treatment adherence and treatment competence. Adherence can be regarded as the frequency with which a therapist uses a specific intervention. The simplest method of assessing treatment adherence is to use a checklist of techniques and rating the occurrence or otherwise of the interventions described in the manual (Waltz, Addis, Koener, & Jacobson, 1993). Therapist competence is a more complex variable to measure. Kazantzis (2003) suggests that therapist competence is best viewed as a “state” variable which varies over time, across clients, and stages of treatment. As such measuring therapist competence would require an ongoing approach. Therapist competence and expertise requires a more flexible and creative application of techniques to the immediate clinical situation than is measured by treatment fidelity (Miller & Binder, 2002). Kazantzis (2003) noted that therapist competence can vary across time, clients and stages of treatment. He suggested that ratings of competence should involve reviewing a number of therapy sessions in succession. This would be a costly and time-consuming procedure and is beyond the scope of this study. With the small number of therapists available to take part in the study resources are not available for taping and rating of sessions in order to assess therapist competence. Adherence, however, can be measured by individual therapists at the end of each session by simple completion of a checklist. A decision was made to assess therapist adherence as opposed to therapist competence.

See Appendix 4 p. 233 for the Cognitive Therapy Checklist

### **Homework Sheets**

The Therapy Manual outlined homework exercises at the end of each session. A set of Homework Sheets was available that summarised homework for each session. These listed exercises, but could be altered manually where variation was required to suit the

individual requirements for each participant. A sheet was available for each session described in the Manual. Record sheets for Activity Schedules, Thought Records, Five Part Model, Problem Solving Worksheets were also included.

See Appendix 2, p. 182 for Homework Sheets.

### **Educational Materials**

A series of educational handouts were prepared for participants that outlined the potential consequences of TBI. Topics that were covered in these handouts included:

- Anger and Irritability
- Attention
- Emotional Changes
- Fatigue
- Frontal Lobe Injuries
- Memory
- Mild Traumatic Brain Injury
- Potential Neurobehavioural Consequences in Traumatic Brain Injury
- Sexuality
- Sleep Difficulties

Consideration was given to the readability of these educational handouts. TBI can impact on cognitive skills that are used in reading, particularly with attention, language and memory processes. Mumford (1997) notes that written health information does not serve a useful purpose if it is not able to be understood by the client. Long sentences and technical terms could be confusing to those who are struggling with the cognitive impacts of their injury. In order to make these handouts accessible to TBI participants, information was provided in two different reading styles. Information was presented in an “standard health information” reading style, as well as in an “easy reading” format using shorter sentences and a larger font, suitable for those participants with problems in memory and concentration who might have difficulty taking in information that was presented in the standard style. Participants were given the choice as to which version of the handouts they preferred to read; with the option of taking both if they wished.

Redish and Selzer (1985) have described a readability formula as a mathematical equation which when applied to prose texts predicts how difficult that text will be for a group of readers. These authors, however, suggest that the best way to determine whether a document is understandable or useful is to test it with a sample of appropriate users, as this can take situational variables into account.

In August 2005, comments on the readability and usefulness of the Educational Handouts were invited from a 41 year old member of the Wellington Brain Injury Association who had sustained a TBI resulting in PTA of 5-7 days, four months previously. He found both versions of the handouts to be straight forward. The simplified versions would be useful for a person who had difficulties in maintaining concentration, and the more standard version useful to take home and read when there was no time pressure.

Flesch and Dobbs (1948) developed a “reading ease” formula that rated a piece of prose on a scale between 0 (practically unreadable) and 100 (easy for a literate person) based on word length and sentence length, that allowed for an estimate of how accessible an article is to its potential readers. This formula was as follows:

R.E. (“reading ease”) =  $206.835 - 0.846 wl - 1.015 sl$ .

- $wl$  = word length as assessed by the number of syllables per sample of 100 words
- $sl$  = average sentence length in a sample of 100 words

Reading Ease was calculated for each of the “standard” and “easy reading” versions of the handouts listed above. For the “standard” versions the Reading Ease was calculated with average 34.10, and standard deviation 11.12. For the “easy reading” versions, the average Reading Ease was calculated as 68.37 with standard deviation as 12.02. Scores between 30 and 50 are described as *difficult* and typical of an Academic magazine, while scores between 60 and 70 are described as *standard* and typical of Digest publications (Flesch & Dobbs, 1948).

See Appendix 3, p. 192, for Educational Handouts.



### **Folders for Participants**

Each participant was provided with a clear-file folder in which to keep therapy materials, including homework exercises, information handouts, and any assessments, such as the Hospital Anxiety and Depression Scale (HADS, (Zigmond & Snaith, 1983) or Patient Competency Rating Scale (PCRS, (Prigatano et al., 1986) that needed to be completed as baseline measurements or at specified times over the course of therapy. Where additional information was provided by therapists, relevant to individual case conceptualisations, this could also be stored in the folders.

### **Piloting the Manual**

An initial trial of the CBT manual was conducted by a Senior Clinical Psychologist from the Massey University Psychology Clinic, with three people who had sustained a TBI. He reported that the therapy manual provided a format for therapy that was easy to follow, but emphasised that clinical judgement was required to adapt the sessions to the individual needs of each person. One person had a prior lifestyle that emphasised achievement and the programme focussed in assisting him to develop realistic expectations following injury and strategies to manage fatigue. Educational handouts were useful for the second person in providing him with validation of his experiences following his injury in that his experiences of symptoms such as fatigue and emotional changes suddenly made much more sense. He was able to apply some of the management strategies that were included in the handouts. For the third person, anxiety and depression scores on the HADS did not reflect true levels due to his low levels of awareness. Therapy assisted with allowing him to develop a system for recognising his emotions.

This feedback obtained from the treatment provided to these three participants highlighted the need for therapists to use clinical judgment in targeting specific referral issues. Educational material needed to be selected as appropriate to specific TBI sequelae experienced by the individual participant. Thought records could be used in assisting participants to identify emotional responses to problems encountered in resuming work and social interactions. Participants could be encouraged to develop

realistic programmes for resuming work that allowed for changes in cognitive abilities and physical consequences such as fatigue.

Although two were able to use the folders to contain educational material and Thought Records, the third with limited levels of awareness of the impact of his injury found the folder confusing, preferring to use a diary as a daily support system to make notes and complete exercises (e.g. recording challenging situations). It was also noted that the CBT approach worked best with those with good awareness of the impact of their injury.

### **Ethical Approval**

Prior to commencement of the project, separate ethical approval for the study was obtained from the Accident Compensation Corporation (ACC) Research Ethics Committee, Massey University Human Ethics Committee, Wellington, and the Central Regional Ethics Committee of the Health and Disability Ethics Committees.

## **Chapter 5: Method**

### **Design**

In any study involving neuropsychological research, it can be difficult to recruit and retain participants, as there is a limited client population, and the symptoms that result from TBI can interfere with the participants' ability to maintain engagement in the rehabilitation process. The needs of participants vary and treatment sessions need to be selected as appropriate for each individual. For this reason, a multiple-baseline study across participants design was chosen. Having each participant as his or her own control eliminated the need for control or wait-list groups. In their study of dropout from psychological groups treatments Hofmann and Suvak (2006) determined loss of participants was unlikely to impact on the validity of studies based on such treatments, but emphasised the importance of minimising participant attrition from research studies. These authors recommended the provision of a logical treatment rationale for therapy in order to minimise dropout rates. The multiple-baseline design allowed for meaningful results from a small number of participants. The design represented a variation on the single case design and was appropriate to outline individual participants' responses to treatment (Wilson, 1987).

### **Participants**

All people with TBI referred to the Clinic for assessment were considered for the study. Nine participants referred for psychotherapy assistance following TBI and who met the inclusion criteria, see p. 60, agreed to take part in the study. Seven of the nine (78%) were male, similar to the range (61.8% - 79.3%) reported by Naugle for TBI (1990). Seven participants (78%) were New Zealand European or European, one participant (11%) Maori, and one (12%) was from the African continent. This small sample approximately reflects distributions in the major categories of these ethnic groups as outlined by Statistics New Zealand (2006), from data received in the 2006 Census, where Europeans account for 67.6%, Maori for 14.6%, and Middle Eastern, Latin American and African 0.9% of the population.<sup>2</sup> At the time of their accident, two participants (22%) had been working in professional occupations

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<sup>2</sup> Other prominent groups in the New Zealand population; Asian (9.2%) and Pacific Island (6.9%) were not included in this sample as they were not referred to the Clinic at the time of recruitment.

(education, engineering), three (33%) in the services industries (hospitality, information systems, credit services), two (22%) worked as drivers, one (11%) was a student, and one (11%) was a pre-schooler at the time of injury.

Age in years of participants in the study at the time of injury ( $m = 31.1$ ;  $s.d. = 14.9$ ; range 5 – 55) and at the time of referral ( $m = 37.1$ ;  $s.d. = 11.9$ ; range 21 – 56) is shown in Figure 5.1. p. 72. The time from injury to referral ( $m = 6.3$  years,  $s.d. = 7.4$  years) ranged from nine months to 21 years. Peak ages for TBI can occur between ages 1 to 5 years, mid-adolescence to the mid-twenties, and after age 65 years (Naugle, 1990). In this sample, peaks occur in the twenty to thirty years age group and in the forty to fifty years group. There was one participant who received the injury before age five years, another at age sixteen years, reflecting trends reported by Naugle (1990). No participant was over the age of sixty years at the time of injury.

TBI forms a risk factor for subsequent psychiatric illness (Fann et al., 2004), with depression (Jorge et al., 2004; Khan-Bourne & Brown, 2003; Kreutzer, Seel, & Gouley, 2001), anxiety (Williams et al., 2003) and pain (Tyrer & Lievesley, 2003) syndromes prevalent following injury. Participants were referred to a Clinical Psychologist for assistance with reducing distress arising from mood and anxiety disorders, management of fatigue and pain, learning compensation strategies to help with cognitive deficits resulting from the injury, and for assistance with reintegration into work, social and family activities. The referral needs of participants are outlined in Table 5.1. p. 73.

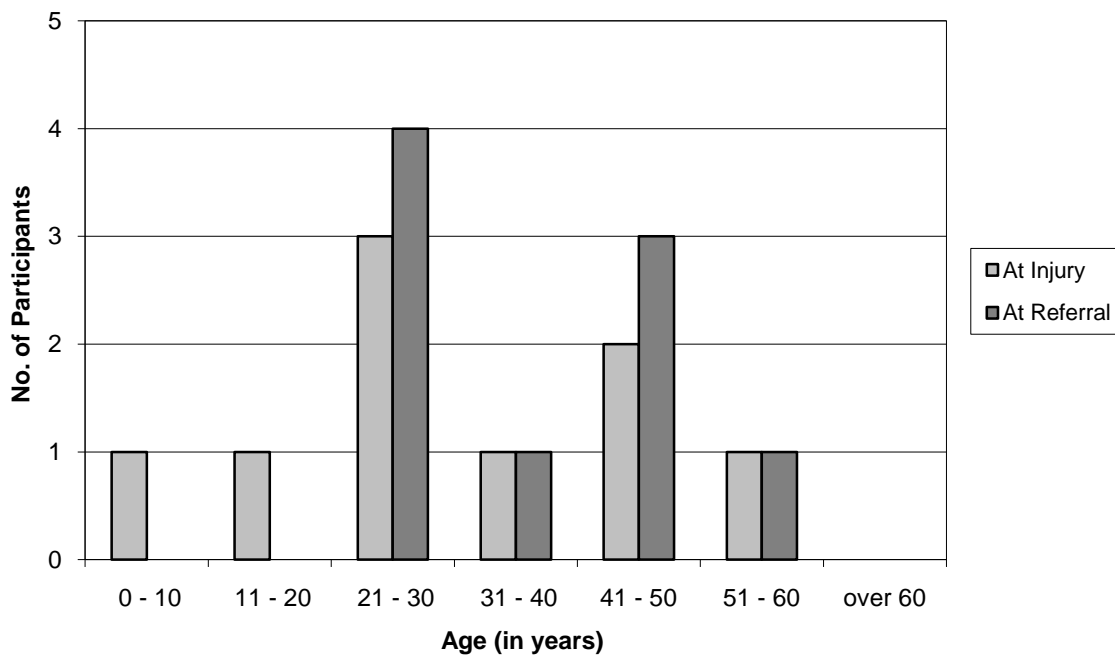


Figure 5. 1. Age of participants at time of injury and at time of referral.

Motor vehicle accidents, including motor cycle accidents, account for about 50% of brain injuries, falls for 28%, with other causes of injury including assaults, sporting, recreational and work-related injuries (Naugle, 1990). In this sample, five participants (55.6%) were injured in motor vehicle accidents, with three involving cars, one a motor cycle and one work-related, involving a truck that jack-knifed. Three participants (33.3%) were injured in falls, one from a ladder at home, one when exiting a taxi, and one when riding a horse. One participant (11.1%) was injured as a child when he was accidentally struck with a brass fitting on a hose which resulted in an open head wound and severe brain injury. Two (22%) of the participants, had experienced prior concussions and two (22%) had pre-injury mental health conditions.

Table 5. 1

*Referral Needs for Participants.*

Participant	Injury Details	Reason for Referral	Compromised Cognitive Functions
One	LOC: 5-10 min.; PTA: 5-6 hours; GCS: 14-15	Depression, anxiety, fatigue, memory difficulties	Slowed information processing; problems with memory, attention, word finding and planning.
Two	LOC: 5-8 min.; GCS: 15; frontal lobe contusion	Depression, headaches, fatigue	Deficits in verbal and visual memory; difficulty in adapting to changes.
Three	Open head injury; bi-frontal contusions, post injury seizures	Difficulties with anxiety and social interaction	Deficits in language, visual construction; concrete reasoning style.
Four	PTA 3-4 days; Multiple severe physical injuries	Major depression, pain and fatigue	Problems with verbal memory.
Five	Broken ribs and damage to back. Intoxicated at injury.	Education on TBI. Fatigue, pain, low mood and anxiety.	Problems with memory and attention, visual scanning, slowed information processing.
Six	Contusions in frontal, temporal and parietal lobes. Post injury seizures.	Management of returning to work, fatigue, communication with family	Problems with maintaining attention, slowed information processing, fatigue.
Seven	Damage to left temporal and occipital lobes.	CBT to assist with fatigue and worry	Difficulties with short term memory, maintaining attention, slowed information processing, fatigue.
Eight	Whiplash injury, cervico-genic headaches	Management of pain, anxiety, low mood, fatigue	Deficits in memory and attention, and with organisational and planning skills.
Nine		Management of depression and anxiety.	Deficits with new learning and cognitive flexibility.

## **Individual Achievement of Personal Goals**

Personal goals were discussed with participants during the initial assessment and introductory treatment sessions. These goals remained a focus of treatment and were reviewed and adapted as appropriate to meet individual participant needs. A brief summary of individual problem areas and the targeted approach of treatment sessions are provided in Table 5.1 p. 73. Common referral areas were management of fatigue and pain; reduction of symptoms of low mood and anxiety; learning to adjust to cognitive changes; and management of a gradual return to employment, training or social activities. A preliminary review had suggested that clients referred for psychotherapy following TBI experienced difficulties with anxiety, depression, irritability and pain. This was a similar finding as reported in the literature with autors Deb and colleagues (1999), for example finding that 13.9% of their sample of 120 people with TBI had a depressive episode and 13.9% had anxiety conditions (panic, generalised anxiety, phobic disorder, obsessive compulsive disorder); and Fann and colleagues (1995) finding 26% of outpatients with TBI having major depression and 24% meeting the criteria for generalise anxiety disorder. Accordingly the purpose of psychotherapy in the current study was to assist participants to reduce those distressing symptoms following TBI which had a psychological component.

## **The Cognitive Behaviour Therapy Manual**

The Cognitive Therapy Manual was described in the previous chapter and was used as a general guideline for treatment sessions. This was adapted to individual requirements as outlined in Table 6.1, p. 88, by the use of targeted strategies such as Activity Schedules in order to gauge weekly commitments, Thought Records to identify personal emotional responses, and the use of the Cognitive Model to illustrate patterns that maintain difficulties with symptoms such as pain, fatigue, worry and negative personal appraisals.

## **Outcome Measures**

The review of clients from the Massey University Psychology Clinic indicated that following TBI, there was an increase in the proportion of clients with mental health conditions with the biggest increase in the areas of anxiety and adjustment. Depression is another mental health condition that is common following TBI (Kim et al., 2007). A measure was needed that could measure levels of anxiety and depression across the course of treatment, another that would measure adjustment and a measure of therapy adherence.

## **Mood and Anxiety**

Care is needed when assessing people with TBI for psychological disorders such as mood and anxiety disorders. In using anxiety and depression scales in this population, there is the potential for confounding of results due to the presence of symptoms attributable to the injury (Ponsford, Olver, Nelms, Curran, & Ponsford, 1999). Those scales that contain fewer items related to somatic symptoms may be more sensitive to depression following injury (Sohlberg & Mateer, 2001). A number of potential self-report scales for emotion were considered for the purposes of this study. These included the Beck Depression Inventory-II (BDI-II, (Beck, Steer, & Brown, 1996), the Symptom Checklist-90-Revised (SCL-90-R, (Derogatis, 1994), the Leeds Scales for Anxiety and Depression (Snaith, Bridge, & Hamilton, 1976), the Depression Anxiety Stress Scales (DASS, (Lovibond & Lovibond, 1995) and the Hospital Anxiety and Depression Scales (HADS, (Zigmond & Snaith, 1983).

There has been discussion as to whether self-report scales such as the BDI-II and SCL-90-R are appropriate for use with a TBI population. Green, Felmingham and colleagues (2001) maintain that BDI cut off scores for at least moderate depression do not appear to be confounded by over-endorsement of somatic/performance items. However, other authors (Ponsford et al., 1999; Sohlberg & Mateer, 2001) caution against the potential confounding of results on self-report scales due to items reflecting symptoms attributable to the injury, such as headache, sleep disturbance and reduced energy.



Leathem and Babbage (2000) suggest that the SCL-90-R should be interpreted with caution when used for people with TBI as some symptoms (e.g., on Obsessive-Compulsive, Hostility and Depression scales) result from brain injury as opposed to psychopathology. Slaughter, Johnstone and colleagues (1999) note that the Brief Symptom Inventory (BSI), a short version of the SCL-90-R, also had some limitations with the interpretation of individual subscales, such as the Obsessive-Compulsive scale for people with TBI.

The Leeds Scales for Anxiety and Depression have been suggested as appropriate for use with a TBI population (Ponsford et al., 1999). These scales provide separate measures for anxiety and depression (Snaith et al., 1976) while minimising emphasis on somatic symptoms. Attempts to contact the publishers of these scales, Psychological Test Publications, were not successful. The scales were not held by Australian or New Zealand test companies. However, the authors of the HADS (Zigmond & Snaith, 1983) separated the concepts of emotional and somatic illness and provided scales that are not affected by illness. These scales are short, containing seven items in each of the Anxiety and Depression scales, giving a total of fourteen items, minimising the impact of administration for those with TBI. The scales are readily available from the nferNelson publishers.

Consideration was also given to the DASS (Lovibond & Lovibond, 1995) which consists of 21 items, providing scales for depression, anxiety and stress. This measure has also reduced the emphasis on somatic items that are poorly related to a depressive syndrome (Lovibond & Lovibond, 1995).

A decision was made, however, to use the HADS as it is readily available, has well researched psychometric properties (Bjelland, Dahl, Ilaug, & Neckelmann, 2002; Moorey et al., 1991; Snaith & Zigmond, 1994; Zigmond & Snaith, 1983) and screens for both anxiety and depression in non-psychiatric patients (Bjelland et al., 2002).

#### The Hospital Anxiety and Depression Scale (HADS)

The HADS is a brief self-report measure with two separately scored subscales, one measuring Anxiety (A-scale) and one measuring Depression (D-scale) . The scale is

brief, consisting of fourteen items in total, seven for each scale, meaning that it can be completed in a waiting room or clinic, with minimal demands on the person. The score for each item ranges from 0 – 3. The scale emphasises how the person has felt over recent days, so is not limited to an immediate stressful situation. It can be scored at regular intervals (e.g., weekly), with a chart provided for recording scores over a period of time. Scores for the HADS Anxiety and Depression Scales range from 0 to 21. Snaith and Zigmond (1994) have allocated descriptors of ‘normal’, ‘mild’, ‘moderate’ and ‘severe’ to these scores as outlined in Table 5.2. p. 77.

Table 5. 2

*Interpretation of HADS Anxiety and Depression Scale Scores. (Snaith & Zigmond, 1994).*

Score	Interpretation
0 – 7	Normal
8 – 10	Mild
11 – 14	Moderate
15 - 21	Severe

The development of the scale was described by Zigmond and Snaith (1983). It was intended that the scale distinguish between somatic symptoms leading to referral to medical services and symptoms arising from anxiety and depressive states. Internal consistency was investigated with correlations between 0.76 and 0.41 for the anxiety items and between 0.60 and 0.30 for the depression items (Zigmond & Snaith, 1983). Subsequently, an investigation of internal consistency with replies from cancer patients (Moorey et al., 1991) determined Cronbach’s alpha of 0.93 for the Anxiety Scale and 0.90 for the Depression Scale. The scale has good face validity (Snaith & Zigmond, 1994), construct validity (Moorey et al., 1991) and concurrent validity (Zigmond & Snaith, 1983).

### **Adjustment and Awareness**

In order for a person with TBI to make progress in re-integrating into the community and resuming a meaningful and productive lifestyle, it is important that they accept the

realities of the changes that have occurred. This means improving self-awareness and self-acceptance. The PCRS can be used to assess progress in this area (Prigatano, 1986; Prigatano et al., 1990). An alternative scale for measuring awareness, is the European Brain Injury Questionnaire (EBIQ) (Teasdale et al., 1997) is also available, but the PCRS was selected for the current study as it is a shorter scale (with 30 items as opposed to 63 for the EBIQ) and has previously been used successfully with a New Zealand Maori population (Prigatano & Leathem, 1993). These measures also assess Activities of Daily Living, emotional coping, interpersonal function and cognitive abilities, providing a guide to everyday functioning.

#### The Patient Competency Rating Scale (PCRS)

The PCRS is a self-report measure consisting of two versions (Patient's form and Informant's form), each with 30 items. The items ask about the person's ability to perform a number of practical skills, and can be divided into areas of Activities of Daily Living, Cognitive Skills, Interpersonal Skills, and Emotional Skills (Leathem, Murphy, & Flett, 1998). Items are rated on a five-point Likert scale, with descriptors ranging from 1 = 'Can't do' to 5 = 'Can do with ease'. Items on the PCRS are listed in Table 5.3., p. 79.

The Informant's version is identical to the Patient's version, with the difference that the relative is recording how they perceive the patient's abilities rather than their own. Comparison of the two scales can give an indication of the injured person's level of awareness of their current behavioural competency.

Reliability figures for the PCRS give  $r = 0.97$  for the Patients' scale and  $r = 0.92$  for the Informants' scale (Prigatano et al., 1990). Heilbronner and colleagues (1993) reported coefficient alpha of .90, split-half reliability of .79 and 1-week test-retest reliability of .82, suggesting good internal consistency and adequate test-retest reliability. Leathem, Murphy and Flett (1998) found that the measure was useful in assessing activities of daily living, emotional skills, interpersonal skills and cognitive skills following TBI. In their study, relatives noticed changes particularly in the areas of emotion, interpersonal relationships, and cognition. The measure appeared to work best for those with clear

difficulty on neuropsychological assessment, but less well for those who perform well on neuropsychological measures, but experience everyday difficulty.

Table 5. 3

*PCRS Items in Areas of Competency and Awareness. (Leathem et al., 1998)*

ADL		Cognitive	
1.	Preparing meals	7.	Keeping appointments
2.	Dressing	9.	Staying involved
3.	Personal Hygiene	10.	Remembering dinner
4.	Washing the dishes	11.	Remembering names
5.	Doing the laundry	12.	Remembering schedule
6.	Managing finances	13.	Remembering things have to do
14.	Driving if had to	25.	Daily activities
26.	Meeting responsibilities	25.	Understanding new instructions
Interpersonal		Emotional	
8.	Starting conversation	16.	Adjusting to change
15.	Getting help when confused	18.	Accepting criticism
17.	Handling arguments	19.	Controlling crying
20.	Acting appropriately	27.	Controlling temper
21.	Showing affection	28.	Keeping from being depressed
22.	Group activities	29.	Controlling emotions
23.	Upsetting others	30.	Controlling laughter

### Homework Tasks

Homework tasks were provided across the course of therapy, as completion of homework assignments improves therapy effects (Kazantzis, Deane, & Ronan, 2005). Participants used homework sheets as reminders of the activities to be completed over the week in between therapy sessions. Homework activities included reading session summaries and educational handouts, completing Cognitive Therapy tasks (e.g., Activity Schedules, Thought Record Sheets, Problem Solving tasks), practising relaxation techniques, and using therapy skills to assist in daily activities. The HRS

(Kazantzis et al., 2004) was used to measure a number of aspects of homework tasks (relevance to client situation, obstacles, difficulty, enjoyment, mastery, and progress).

### The Homework Rating Scale (HRS)

Kazantzis, Deane and Ronan (2004) noted that there has been inconsistency in methods used for assessing homework compliance, with using single-item global measures, and the constructs of quantity and quality. These authors developed the HRS to overcome these limitations. Client, therapist and task characteristics involved in homework compliance are measured using 12 distinct items, which separate the constructs of quality and quantity. Items are rated on a 5-point scale, specific to each item (e.g. 0 = not at all to 4 = completely). An updated version of the HRS, the Homework Rating Scale-II (HRS-II), (Kazantzis et al., 2005) aims to obtain information about the difficulties in completing homework assignments. The authors have noted that non-compliance provides opportunities to review the cognitive conceptualisation and treatment goals. Psychometric data are yet to be developed for the HRS-II.

The HRS-II is a self-report questionnaire consisting of 12 questions. These questions measure the following aspects in the process of using homework assignments in Cognitive Behavioural Therapy

- Comprehension, rationale, collaboration and specificity (questions 5, 6, 7 and 8 respectively)
- Obstacles (question 4)
- Quantity and Quality (questions 1 and 2)
- Difficulty, pleasure and mastery (questions 3, 10 and 11)
- Match with therapy goals, progress (questions 9 and 12)

Each question is scored on a scale of 0 – 4, with individual descriptors for each question. Generally, 0 indicates lower achievement or relevance to the therapy process. However, reverse scoring is used for Question 3 (difficulty) and Question 4 (obstacles). Published psychometric data on the HRS-II were not available for use with this research project. Questions on the HRS-II can be used by the therapist as prompts for discussion in therapy sessions.

Kazdin (2003) noted that a clinically significant change refers to whether the effect of an intervention makes a “real” difference to a client or to others in everyday functioning. This could be illustrated for example, by learning to manage effectively in social or family situations, returning successfully to work, a noticeable reduction in symptoms, or no longer meeting criteria for a psychiatric diagnosis. In that respect, achievement of personal goals, a clear reduction in symptoms as measured by the HADS Anxiety (HADS-A) and Depression (HADS-D) Scales, or an improvement in levels of practical skills as measured by the PCRS (Prigatano et al., 1986) represents clinically significant change for participants.

## **Procedure**

The process of recruitment is shown in Figure 5.2, p. 83. Participants were recruited through the Massey University Psychology Clinic, Wellington. In the first instance, potential participants were identified by Clinic staff from people who were referred for psychological assistance following TBI. Once potential participants with TBI were allocated to a Clinician, an initial assessment interview was scheduled. If it was determined that the person referred demonstrated symptoms of depression, anxiety, irritability, pain syndromes, or required assistance in re-integrating into work or the community, he or she was invited to take part in the research study. Participants were informed that if they did not wish to take part in the Research Project, the psychotherapy approach available to them would be the same as that used in the study; the implications of taking part in the project were that measures taken across the course of therapy would contribute to the Research Project. Information and Consent Sheets were provided outlining the purpose and processes of the study.

For those who agreed, initial baseline measurement with the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983), was taken at the assessment interview. Participants were provided with two further sets of HADS baseline measures and the Patient Competency Rating Scale (PCRS; Prigatano et al., 1986), Patient and Relative’s versions, with a sheet listing dates for completion of these measures and stamped addressed envelopes to return completed measures to the Clinic. Throughout the project, the clinical needs of participants remained a priority over the requirements

of the research study. The proposed schedule for administration of HADS, PCRS and HRS-II measurements is outlined in Figure 5.3. p. 84.

For those who were able to travel, therapy sessions were held at the Massey University Psychology Clinic. Two participants, however, were seen in their homes following the initial assessment session, one because he experienced seizures and was unable to drive himself, and the second who did not have access to transport, or a driver's licence and would have needed family members able to drive her.

During each session, the HADS was administered, homework tasks were discussed, and an agenda was agreed on that incorporated client concerns with suitable topics from the manualised treatment programme, and appropriate homework tasks were set at the end of the session. Homework sheets were used as reminders of homework tasks and were adapted as required on an individual basis. Each participant was provided with a clear-file folder in which to store therapy materials and homework sheets. Clinicians provided materials as relevant to each session. Psychometric data, session materials and case notes were completed by clinicians, and stored in Clinic files, following the standard Psychology Clinic Files Procedure.

### **CBT Treatment Approach**

The therapy used for treatment followed the CBT session by session approach outlined in the Therapy Manual in Appendix 1, p. 152. Two Senior Clinical Psychologists and two Intern Psychologists provided the manualised treatment. There was a focus on identification and challenging of thought processes and beliefs that were counterproductive in facilitating recognition of changes and optimal adjustment to returning to work, study and social activities following injury. Sessions were adapted to meet the needs of participants, whilst also taking into account factors such as levels of fatigue and pain, and the participant's ability to maintain attention and communication skills. Recommended session times were for 50 - 60 minutes. Family members were able to attend sessions with participants, as appropriate to individual therapy goals.

Adherence to the treatment manual was measured for the purposes of this study by using a checklist of interventions for each session. See Appendix 5, p. 235.

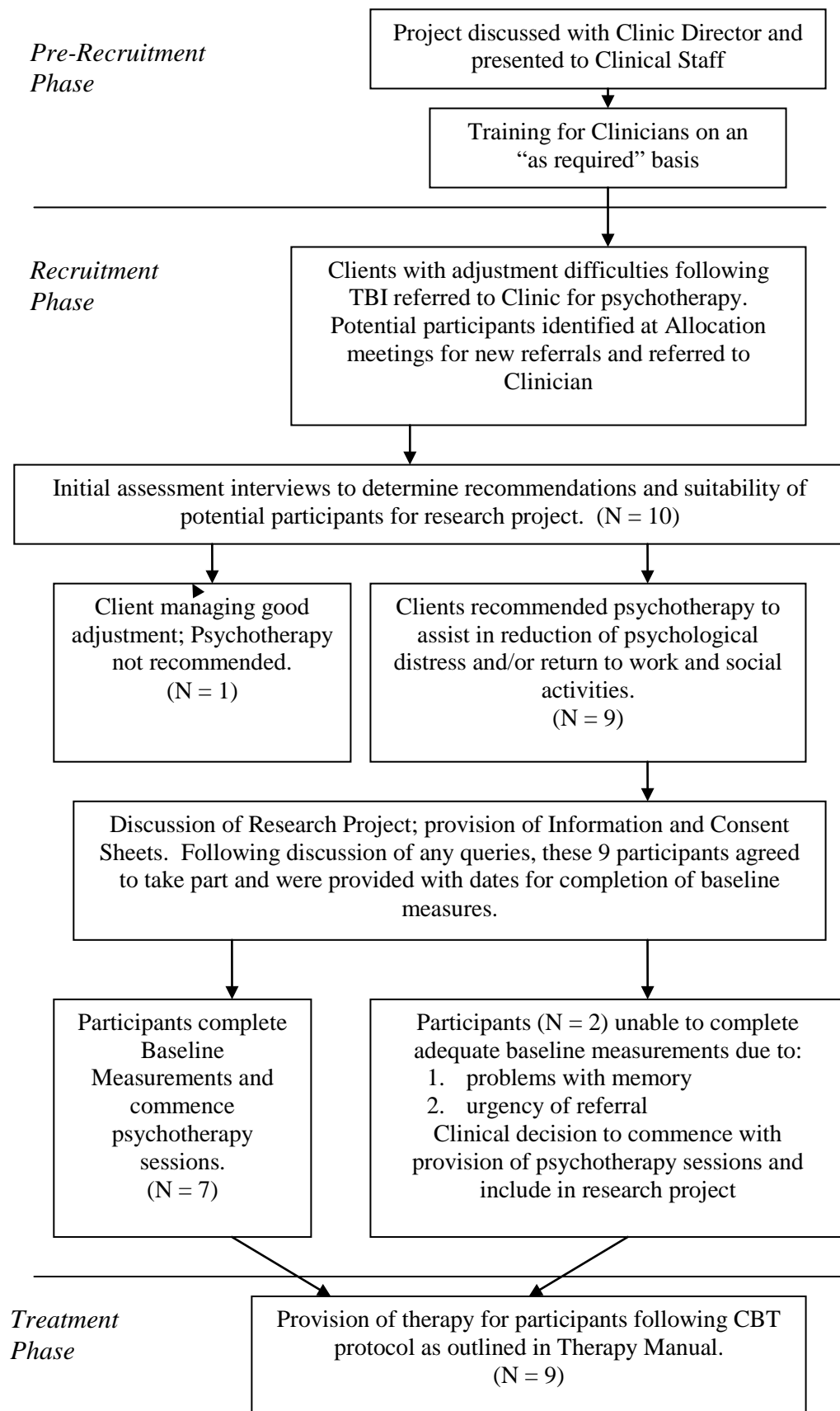


Figure 5.2. Recruitment of Participants and Clinicians for Research Project



*Initial Assessment and Recruitment*

**Baseline Measurements:**

HADS at initial assessment and 2 further time intervals

PCRS completed by participant and family member at commencement of Treatment Sessions.

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*Treatment Sessions*

**Measurements Across Therapy**

HADS completed at each session

PCRS completed towards end of therapy sessions

HRS-II completed for selected Homework Tasks

*Figure 5.3.* Proposed Schedule for Administration of HADS, PCRS and HRS-II Measurements

## Chapter 6: Results

It was initially intended that the study would follow a multiple-baseline across subjects design. However a number of problems arose with this design.

Firstly, the minimum requirement of three baseline readings was achieved for only four of the nine participants. This occurred because commencement of treatment was often based on the clinical grounds which did not allow for each participant to commence treatment once the effect of treatment stabilised for the previous participant (Sarafino, 2005), nor in one case before baseline recordings were obtained. These participants however, were still included despite incomplete baselines as they reflected the reality of clinical practice and had the potential to provide useful information. Secondly, cognitive difficulties with memory and organisational skills resulting from TBI meant that some participants did not manage to complete baseline measurements.

The study as planned was further compromised by discrepancies between what participants were expected to be referred for (based on review of files) what they were referred for, and what they actually turned out to need assistance for. While participants were selected based on presence of mood, anxiety and adjustment issues following TBI in relation to returning to work and social activities, not all participants were found to have significant Anxiety or Depressive symptoms at baseline as measured by the HADS (Zigmond & Snaith, 1983). For some participants, as it turned out, depression and anxiety appeared to be secondary to other presenting issues such as pain or fatigue and adjustment to difficulties in returning to work, family and social situations. Accordingly, the main focus of the CBT intervention in such cases and the efficacy of the CBT intervention was better gauged by qualitative information.

Finally, completion of the HADS, PCRS, and HRS-II measures also varied across participants, due to difficulties with memory and organisational skills, and not having informants available to complete measures.

Two final barriers to implementing the research as originally planned involved the inconsistent completion of homework assignments due to organisational, fatigue and

memory difficulties, and the number of sessions which varied according to the number that had been approved by referring agency ACC<sup>3</sup>.

Results for each participant have therefore been presented as a series of case reports. Clinical case reports are typically observational and allow for a focus on the treatment of disorders in individuals, providing descriptions of treatment outcomes (Martin & Hull, 2007). The only group results are for Anxiety and Depression.

There will be discussion of the extent to which the manual was followed with participants in the study. The chapter will then focus on group results in reducing symptoms of Anxiety and Depression as measured by the HADS (Zigmond & Snaith, 1983). This will be followed by case studies outlining the progress of individual participants in achieving personal goals, with regard to resuming work, social and household activities following injury. Participant compliance with homework assignments as measured by the HRS-II will be outlined towards the end of the chapter.

### **Adherence to Therapy Manual**

The Cognitive Therapy Checklist was completed by therapists and from client records for each participant. See Appendix 5, p. 235 for a summary of scheduled tasks from the Therapy Manual completed in each treatment session. All participants received an initial comprehensive psychological assessment. With some participants (1-3, & 8) adaptation of sessions in order to meet specific clinical needs meant that treatment was condensed into fewer sessions, or that alternative tasks were used in later sessions. Components completed by all participants included the Activity Schedule; discussion of the Cognitive Model as applied to their specific referral issue; discussion of obstacles to achieving personal goals; and the opportunity to focus on identifying their own issues and items for discussion. All participants with the exception of Participant Eight were able to complete Thought Records. All participants were introduced to relaxation strategies in treatment sessions. Participant Eight was introduced to the concept of using relaxation but preferred to use a technique learned prior to therapy, rather than

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<sup>3</sup> For five participants (One, Four, Five, Eight and Nine) treatment sessions concluded once the approved number of sessions had been completed. For three participants (Three, Six and Seven) further sessions were sought and approved, but did not form part of this study. For Participant Two, sessions were concluded when he ceased to attend.

attempt new strategies in session. Alternative ways of expressing the impact of the TBI are discussed as appropriate for individual clients in Session 4 of the Manual. Participant Seven was able to complete an artwork in crayon, which symbolised her experience of her injury and the differences between life prior to and following the injury. This symbolised the straight direct pathway that her life followed prior to injury, the injury shown with a lightning bolt, and the reduced level of output that she was focused on post injury (see Appendix 6, p. 239). Participant Nine was able to identify stories and songs that had meaning for her in relation to her injury experience.

### **Group Data**

Table 6.1 p. 88, outlines both participant problems at referral and specific participant goals. Problems included physical conditions such as fatigue and headaches, cognitive impairment with difficulties in memory, concentration and organisational abilities, emotional consequences such as low mood and anxiety and psychosocial difficulties with communication and social interaction. Specific participant goals focused on adapting to changes following injury, returning to work, managing daily responsibilities, reducing emotional distress and improving management of social situations. Over the course of treatment sessions covered in this study there were more noticeable improvements in personal goals than with anxiety and depressive symptoms as measured by the HADS.

Table 6. 1

*Targeted Individual Treatment Approach*

Participant	Age (years)	Occupation	Problem area	Specific goals	Manual Adaptation	Outcomes
1	46	Engineer	Fatigue, headaches, depression, anxiety and memory difficulties	Manage increase in work hours and responsibilities	Use of Thought records to identify emotional reactions	Decreases in scores on HADS Scales
2	26	Delivery van driver	Fatigue, headaches, depressive symptoms	Adapting to changes incurred with injury	Education and acknowledgement of impact of TBI.	Understanding of personal impact of injury
3	26	Job seeker	Difficulties with anxiety and social interactions	Improve insight into emotional reactions	Use of diary to improve insight into emotional reactions	Increased involvement in training activities
4	27	Computer technician	Depression, fatigue and pain from injury	Improve motivation, decrease depressive symptoms	Identification of emotional responses	Small decrease in HADS Depression Scores; identification of problem areas
5	47	Maintenance technician	Difficulties with pain, fatigue, low mood and anxiety	Management of a sustainable work pattern	Use of Thought Records to identify emotional reactions and triggers	Decrease in HADS scores, recognition of need to pace work activities
6	49	Secondary School teacher	Problems with fatigue, concentration and communication with family	Managed return to full time work in readiness for following year	Use of 'paced' approach to management of fatigue	Return to full working week; improved awareness of emotional responses

Participant	Age (years)	Occupation	Problem area	Specific goals	Manual Adaptation	Outcomes
7	21	Student	Problems with fatigue, headaches, worry, memory and concentration	Management of fatigue, strategies to manage worry	Pacing activities; problem solving; compensatory strategies	Improved confidence in managing fatigue, worry, and memory difficulties
8	56	Truck driver	Pain, fatigue, low mood, difficulties with memory and organisational abilities	Improvement of ability to manage pain and daily responsibilities	Education on TBI impact; pain management strategies	Understanding of need to take regular rest and relaxation breaks
9	36	Credit Controller	Anxiety, depression and fatigue following TBI	Reduction of symptoms of distress; management of social and work situations	Education on impact of TBI; activity scheduling; recognition of emotional responses	Rapid reduction of HADS scores; increased confidence at work and in social interactions

### Progress in Reduction of Symptoms of Anxiety and Depression:

#### HADS A Scores:

At the commencement of treatment sessions, six participants (1, 2, 5, 7-9) had HADS A scores that were outside the *normal* range, (with Participant Nine having *severe* levels of Anxiety). At the conclusion of sessions, the HADS A scores of three of the six (2, 7 & 8) had not changed, and three had improved (1, 5 & 9; with Participant Nine moving from the *severe* to the *normal* category). These results are illustrated in Figure 6.1., p. 90.

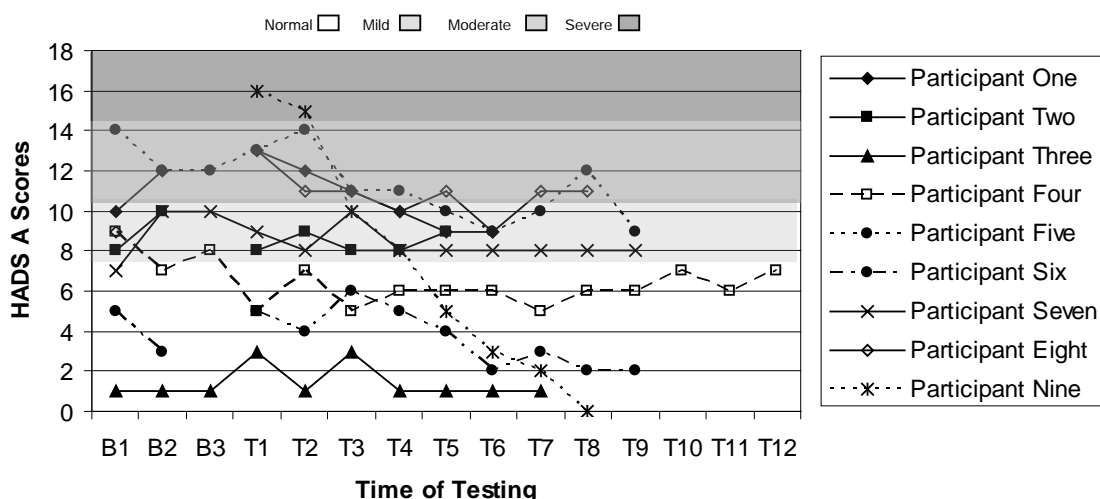


Figure 6.1. HADS A scores across baseline and treatment for all Participants.

#### HADS D Scores:

At the commencement of treatment sessions, five participants (1, 4, 5, 8 & 9) had HADS D scores that were outside the *normal* range (with Participant Four having *severe* levels). Over treatment, three (1, 5, & 9) experienced a reduction in the severity of their level of depression while Participant Four remained in the *severe* category, (although he moved into the *moderate* category across treatment sessions) and Participant Eight had an increase in level of depression, moving to the *moderate* category. These results are illustrated in Figure 6.2., p. 91.

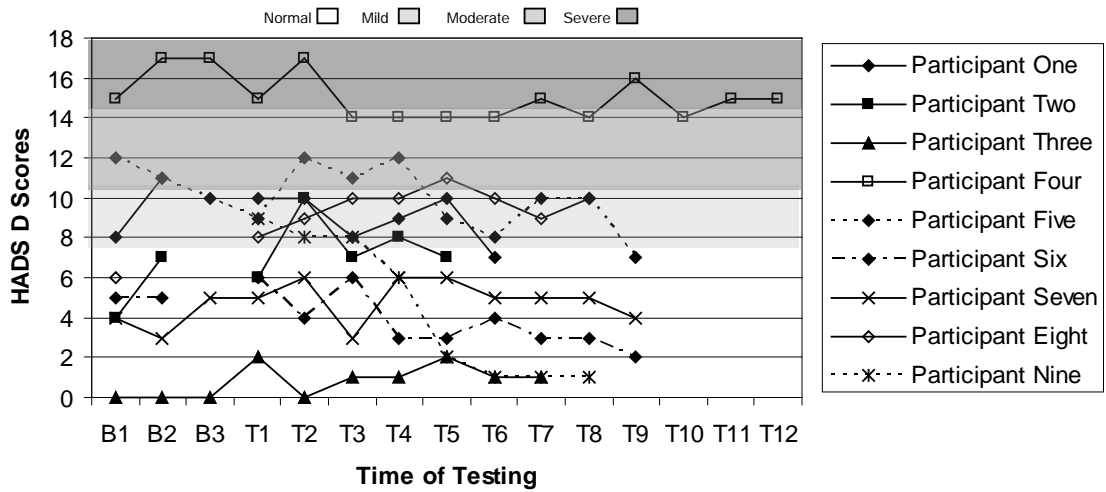


Figure 6.2. HADS D scores across baseline and treatment for all Participants.

Due to the small sample size and spread across data it was not possible to draw conclusions about the effectiveness of CBT in reducing symptoms of depression and anxiety after TBI as measured by this scale. Individual progress in reduction of symptoms of Anxiety and Depression will be discussed as part of each individual case study.



## Case Studies

### Participant One:

Participant One was referred for psychological assistance following difficulties that he experienced in his efforts to increase his work load and return to work, subsequent to sustaining a TBI in a motor vehicle accident 24 months previously. His return to work was adversely affected by his high levels of fatigue and his initial expectations that he would be able to return to work at the same level as prior to his accident. In addition he expressed concerns about the impact of his injury on his personal life and family. At the time of his injury, two years prior to his referral, he was 44 years of age.

Prior to injury, Participant One had worked as an engineer in a senior management capacity in a large utilities company, a position that required a high level of executive and organisational skills. He had no history of mental health issues. He experienced retrograde amnesia of 7 hours, LOC of 5 – 10 minutes, PTA of 5 – 6 hours and a GSC of 14 – 15 on arrival at hospital. Following the injury, he experienced post-concussion neuropsychological sequelae. On returning to work he found that his performance was hindered by poor memory and attention and slowed information processing as well as significant fatigue and headaches. A number of attempts to increase his work load after returning to work had been unsuccessful due to his high personal expectations regarding the physical and mental effort that he could effectively sustain. As a consequence he pushed himself to the extent that his work efforts impacted negatively on his quality of life. He had a tendency to compare his post-injury performance to his pre-morbid functioning. This led to fluctuations in his mood and an increase in his levels of anxiety. Stressors in his work and concern about the impact of his injury on his family finally led to his resignation from his job two years after the accident in order to take time to focus on his recovery. On his referral for psychological assistance, he presented as a person who was motivated to perform well and demonstrated good insight as to how his injury had impacted on him psychologically.

*Adaptation of Therapy Programme:* The main emphasis of Participant One's referral was on providing assistance with the difficulties that he experienced in increasing his work load and returning to previous levels of employment, and on addressing his

concerns about the impact of his injury on his personal life and family. Treatment targeted optimal management of Participant One's level of fatigue, which had adversely impacted on his abilities to return to his pre-injury workload. At the commencement of treatment sessions he was provided with psycho-educational material related to the impact of his TBI, which assisted him to develop insight into the impact of his post-injury level of fatigue. Completion of the Activity Schedule identified that Participant One maintained a full daytime schedule with activities interspersed with rest periods. By adapting this schedule he was able to use his rest periods in a pre-emptive manner to prevent the onset of fatigue, rather than in a reactive manner following the onset of fatigue. He was able to identify that he missed the social interaction with former colleagues and took steps in re-initiating this aspect of his social life. A further behavioural intervention was the use of relaxation exercises, with progressive relaxation producing noticeable benefit in relaxing his ankles and elbows.

Cognitive interventions included completing Thought Record diaries to identify situations that triggered strong emotional responses. Participant One demonstrated a tendency to judge himself harshly, assuming a large proportion of responsibility for issues that were outside of his control, for example, the actions of his family. He had a tendency to personalise his family's discontent. In one situation he interpreted his daughter's resignation from a job as his failure to install a suitable work ethic, whereas when the situation was examined in detail, she had persevered for some time in spite of ongoing difficulties. In this way he was able to challenge the negative automatic thoughts that led to his fluctuating levels of mood and anxiety and to examine cognitive distortions (for example "should" and "must" statements) and unhelpful behavioural responses. Instead of pushing himself in an unrealistic fashion he was encouraged to adjust his expectations of himself in the light of his injury, for example with his inability to engage in rigorous physical activity, and to engage in less self criticism around having a reduced ability to be productive.

*Outcomes:* Participant One was able to develop insight into the adjustments that would be required in order for him to eventually make a successful return to work. The focus of the intervention was on his tendency to push himself in an unrealistic fashion due to his high levels of personal expectation, which led to increased levels of fatigue and lowered cognitive efficiency. Challenging his negative automatic thoughts around his

perceived lack of productivity allowed him to experiment with a more realistic gradual approach to rehabilitation within his work and social situations. While his levels of both anxiety and depression as measured by the HADS reduced slightly over the course of therapy, some frustration and anxiety could persist around the slow progress of recovery and return to work. It was recommended that Participant One manage his return to work in a graded fashion that took into account his reduced energy levels and the impact that fatigue could have on his performance. He was able to engage in less self criticism, and to adjust his work expectations, reassessing his ability to return to his former workload.

*Outcome Measure:* Participant One completed six treatment sessions, following baseline, with the number of sessions being determined by ACC allocation. At baseline both his scores on the HADS-A and HADS-D Scales were within the *mild to moderate* categories. See Figure 6.3., p. 95. Over treatment sessions, his HADS-A scores moved from the *moderate* to the *mild* category at the conclusion of sessions. His average baseline score of 11.0 across baseline conditions reduced slightly to an average score of 10.7 across treatment sessions. Scores on the HADS-D fluctuated, but the overall trend demonstrated scores moving from the *mild to normal* category over treatment sessions. The average score of 9.5 across baseline reduced to an average of 9.00 across treatment sessions.

The PCRS was completed by Participant 1 at the commencement of treatment sessions only, with the Informant Version completed by his wife. At the conclusion of allocated sessions, he did not remember to complete the second set of measures. On both Patient and Informant versions, he was rated as having the least difficulty with Activities of Daily Living. See Figure 6.4, p. 95. Informant ratings provided a higher estimate of abilities than Patient ratings across all areas with the greatest difference on Interpersonal skills. Leathem, Murphy and Flett (1998) found that significant differences can arise in the area of interpersonal relationships on the PCRS, with self ratings indicating more difficulty than informant ratings because an informant may not necessarily know that the patient is experiencing difficulties as these may be covert. Both rated his ability to “stay involved in work activities when tired or bored” as very difficult. Participant One also rated memory, obtaining help when confused, and controlling his temper as difficult for him to manage effectively.

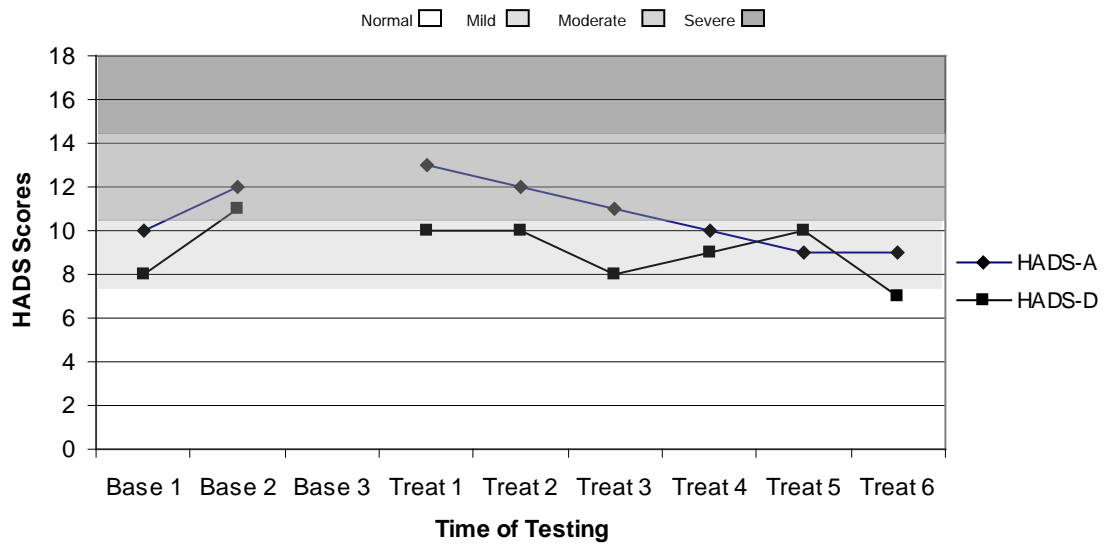


Figure 6.3. HADS scores across baseline and treatment conditions for Participant One.

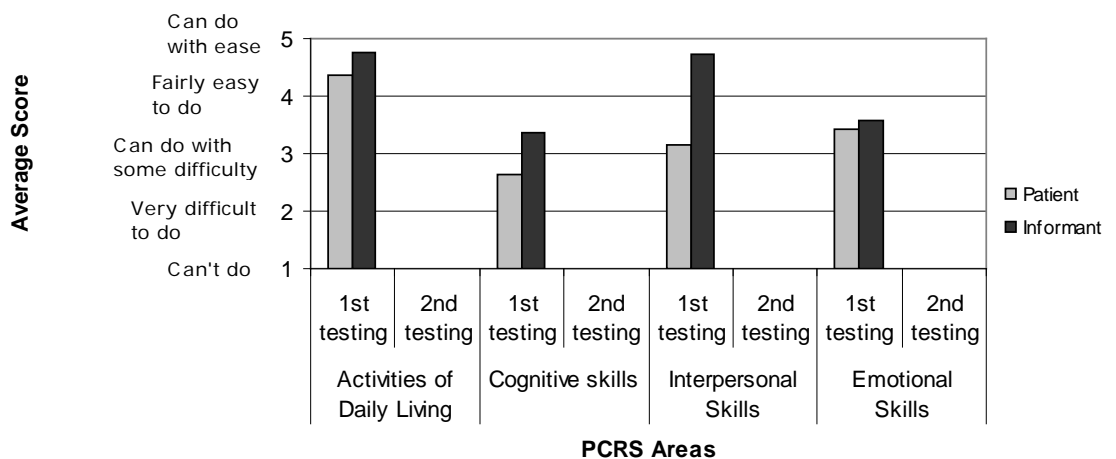


Figure 6. 4. Average ratings across PCRS Areas for Participant One.

Participant Two:

Participant Two sustained a TBI when he attempted to get out of a van that was travelling at 50 km/hour whilst moderately intoxicated. Following the injury, he experienced difficulties with memory, maintaining concentration, and ongoing fatigue. At the time of his injury, nine months prior to his referral, he was 26 years of age. The

referral was for assistance with symptoms of fluctuating mood, and to learn techniques to manage his post concussion symptoms.

Pre-injury employment for Participant Two included working as a driver and in spray painting of vehicles. Scandinavian studies (Dick, 2005) have suggested that long term, high solvent exposure, such as can occur in the coatings industries, may be associated with personality change, memory impairment and neurological deficits; however, there was no indication that these symptoms were evident prior to Participant Two's injury. At the time of his injury, Participant Two lost consciousness for 5 – 10 minutes. PTA was estimated as approximately one hour. A CT scan conducted two days later revealed a haemorrhagic contusion to the right inferior temporal lobe. Following the accident, he experienced severe headaches, tinnitus, nausea and intermittent dizzy spells that on occasion caused him to collapse. He experienced periods of low mood, primarily precipitated by the frustration associated with attempting activities that he had previously found to be easy. He had regarded himself as being 'tough', and found it difficult to accept the impact of his injury. Prior to his injury, he regularly worked out at the gym. Since the injury, his acute dizzy spells made physical exertion difficult. Following his discharge from hospital, he went back to living with his parents, spending most of his time around the house, and supplementing his income through internet auctions.

Cognitively, Participant Two's greatest difficulties were with short term memory and with maintaining attention. He repeated questions throughout the day and had difficulty in remembering where he left his keys, locking himself out of the house on three occasions following the accident. He also demonstrated difficulty in adjusting to change. He was more irritable than prior to his injury and found his levels of fatigue to be a major problem in resuming activities. He became frustrated at the slow progress of his recovery and his mood tended to fluctuate, reflecting a self defeating cycle whereby he compared his current and pre-injury levels of achievement.

*Adaptation of Therapy Programme:* During the course of treatment sessions, Participant Two continued to experience ongoing difficulties with memory, attention, fatigue and fluctuating mood. The emphasis of the treatment programme was on recognising his

need to manage his fatigue and on addressing his concerns around perceived negative evaluations by others.

Participant Two benefited from the educational component of the programme which validated his experience of the downstream effects of TBI. This assisted him in recognising the need to allow for his increased levels of fatigue which adversely impacted on his memory and his ability to maintain his concentration. He was able to use compensatory strategies to assist with memory difficulties, purchasing an electronic diary off the Trade Me website, and finding a suitable place to store a key for when he locked himself out of the house. Previously, Participant Two had enjoyed working out at the gym maintaining a high standard of fitness. He was able to increase his levels of fitness by increasing his physical activity, resuming his workouts at the gym and monitoring his diet.

Completion of Thought Records identified that Participant Two experienced social anxiety, worrying how to respond when others asked him “What are you doing?” He worried that others would judge him for being out of work and for how his injury occurred. He was able to identify that he could respond with “I am between jobs.” When at the gym he worried that others would evaluate him in a negative fashion, regarding him as weak and out of shape. He identified the beliefs “There’s something wrong with me” and “I’m bad company.” Use of the Extended Thought Record assisted him in rationalising these thoughts based on actual experience and generating alternative thoughts, to apply in these situations, for example, “I am in better shape (than some of the others).”

During periods of low mood, Participant Two reported feelings of hopelessness and discouragement about his future. At the time of his referral his GP commenced him on a low dose of an antidepressant which helped him to feel less discouraged. He made a proactive decision to move out of his depressed state. During the course of treatment sessions, Participant Two gave serious consideration to returning to employment, had begun perusing situations vacant, had updated his CV and was applying for jobs. He remained aware, however, that he could have difficulty in maintaining a satisfactory work performance and recognised that it could be prudent to return to work in a graded

manner, ensuring that difficulties with fatigue, memory and concentration did not undermine his work efforts.

*Outcomes:* Participant Two was able to acknowledge the emotional impact of his injury as treatment sessions progressed, which could have led to the decrease in his level of confidence in the Emotional Area on the PCRS. He experienced ongoing mood fluctuations related to the slow nature of his recovery. Participant Two appreciated the validation of his experiences that was provided by the educational component of therapy. Behavioural interventions included increasing his level of physical activity and fitness. Cognitive interventions assisted him in challenging his perceptions that others were judging his slow recovery and return to work, and in developing strategies to address these concerns. Before he concluded his treatment sessions, he was enjoying working out at the gym with less regard to potential criticisms by others, was able to respond to enquiries about his work situation, and was planning for the future, while remaining mindful of the need to return to work in a gradual fashion.

*Outcome Measure:* Participant Two completed 5 treatment sessions, following baseline conditions. See Figure 6.5., p. 99. Treatment concluded because he ceased to attend. At baseline his scores for the HADS-A Scale fell within the *mild* range with an average score of 9. His scores for the HADS-D Scale fell within the *normal* range with an average score of 5.5. Across treatment sessions, his Anxiety scores stabilised, with an average score of 8.4, a slight reduction from baseline, within the *mild* range. His Depression scores across treatment varied, falling within the *mild* range on two occasions. His average treatment Depression score was 7.6, an increase from baseline conditions. However, the trend line for these scores had levelled.

The PCRS was completed by both Participant Two and his mother at the commencement of treatment sessions, and by Participant Two prior to his cessation of attendance at treatment sessions. See Figure 6.6., p. 99. At the second time of rating he did not manage to organise for his mother to complete the Informant version. At the initial assessment, Patient and Informant ratings indicated Activities of Daily Living and Interpersonal Skills as being areas in which he functioned with some confidence, with less confidence in the areas of Cognitive and Emotional Skills. The items that were rated as causing the most difficulty were those involving memory, management of

emotions, adapting to change and initiating his daily routine. Patient ratings demonstrated less confidence with Activities of Daily Living, Interpersonal and Emotional Skills at the second time of rating; however, these were closer to initial Informant ratings. While he reported an increase in his Cognitive Skills from the commencement of therapy sessions, he also noted decreases in his Activities of Daily Living, Interpersonal and Emotional Skills. With Interpersonal Skills, this change could indicate an increase in his level of insight as at the conclusion of sessions, his estimation of skill level matched that of his mother at the commencement of the therapy process.

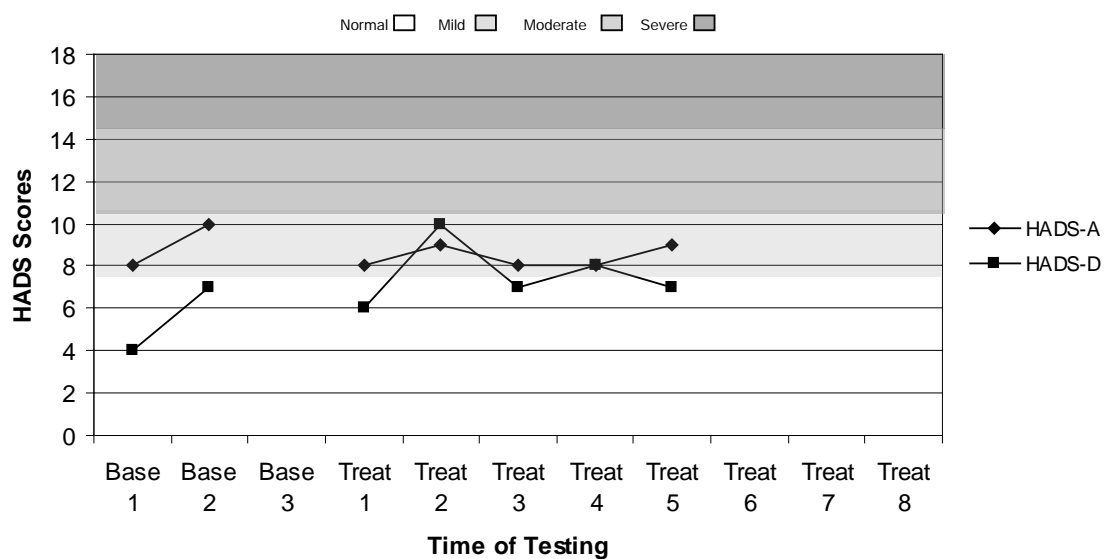


Figure 6. 5. HADS scores across baseline and treatment conditions for Participant Two.

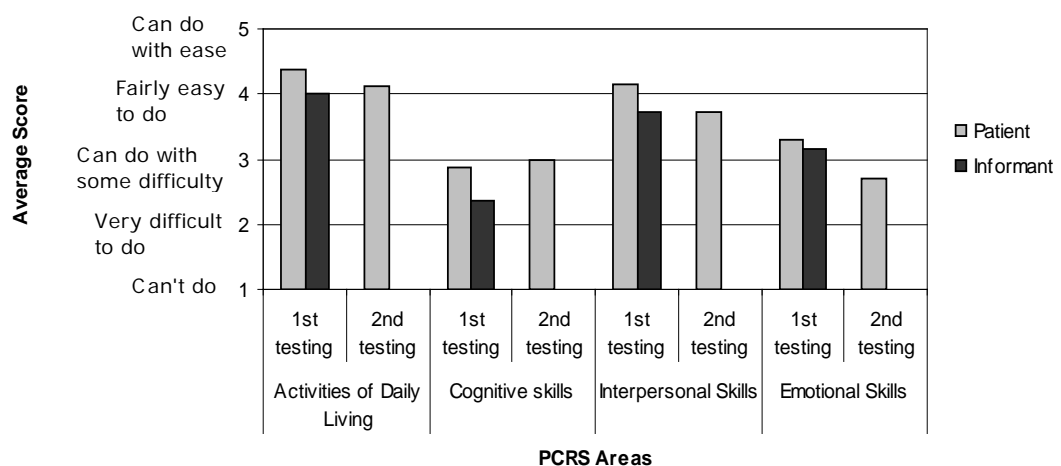


Figure 6. 6. Average ratings across PCRS areas for Participant Two.



Participant Three:

Participant Three was referred for assistance with interpersonal relationships, both at home and in social situations. He was not depressed, but found personal interactions to be difficult due to his high levels of interpersonal sensitivity and tendency to personalise social situations. He had limited insight into his emotional reactions.

Participant Three's TBI occurred when he was five years of age, 21 years prior to his referral, when he was struck by the brass end of a hose that had broken loose during a fire demonstration, resulting in an open head injury. A CT scan showed bilateral contusions, and intra-cerebral haematomas. Neuropsychological assessment, prior to his referral, indicated deficits in the areas of language and complex visual construction, as well as reasoning difficulties and a tendency to think in a concrete manner. He developed posttraumatic seizures shortly after the accident, which resolved quickly. Renewed seizure activity when Participant Three was 22 years of age was treated with Phenytoin medication. Since that time, he has remained seizure free.

While he had been well liked while at school, Participant Three demonstrated difficulty with aspects of learning and regularly required one to one assistance. He was able, however, able to complete some 6<sup>th</sup> form certificate subjects before leaving school. Since then he had made ongoing attempts to train and obtain work and had attended training groups. However, he had intermittent clashes with others at these groups. His limited insight into how to manage his emotional reactions, in combination with his high levels of interpersonal sensitivity and low levels of resilience led to his difficulties with social interaction. At the time of referral, Participant Three was living at home with his parents.

*Adaptation of Therapy Programme:* The purpose of treatment sessions with Participant Three was to assist in his return to the workplace and to improve his ability to manage social situations and his interpersonal relationships. He experienced ongoing difficulties in managing social interactions, and had a tendency to misinterpret instructions in the workplace.

Meticulous completion of the Activity Schedule revealed that Participant Three kept regular hours for waking and going to bed. His daytime activities consisted of watching TV, using the computer, visiting others and completing tasks around the home. At weekends he took part in Athletics activities which he found satisfying and was able to develop further.

A major difficulty was Participant Three's limited self awareness, which impacted on his ability to make use of the cognitive tasks in the programme. He demonstrated cognitive distortions in his tendency to refer to situations as 'good' or 'bad', having difficulty in distinguishing variations of behaviour or interpersonal reactions. Participant Three used a diary to manage his time. This was used in place of Thought Records to identify themes and patterns that impacted on his levels of stress. He used the diary to record his thoughts and reactions. He found difficulty with subsequent tasks requiring greater levels of abstraction (e.g., problem solving, and identifying personal belief systems). A key focus of treatment sessions was to assist him in identifying his emotional reactions to social situations. In one treatment session the Five Part Model was used to illustrate a situation that arose when he perceived his mother as procrastinating when he was in a hurry. He was able to identify that his lack of communication with his mother possibly led to an escalation of the situation and an increase in his levels of stress. Diary records indicated that he was quick to react to situations in an angry manner for example, when being required to run in a T shirt rather than a singlet at an Athletics meeting. Through in-session discussion, Participant Three was able to develop a degree of insight into how his emotional reactions and subsequent behaviour in specific social situations impacted on outcome. He was encouraged to react in an assertive rather than aggressive manner when faced with confrontational situations. Strategies for responding to criticism were practised in treatment sessions.

*Outcomes:* One rehabilitation goal for Participant Three was for him to manage some form of part-time employment. Attempts to place him in a working environment had proved difficult in the past as he had a tendency to quickly withdraw from work trials or training opportunities when he perceived that difficulties had arisen or he was being evaluated in a negative fashion. During therapy he was encouraged to develop insight into his emotional reactions and interpersonal behaviours, and to challenge his view of

social situations as “good” or “bad”, recognising variations in behaviour. He was able to increase his level of involvement in Athletics activities, and later to complete a successful work trial. At home he was able to identify the impact of poor communication within his family. While difficulties with interpersonal sensitivity were not able to be fully resolved over the space of treatment sessions, these formed the basis for a further referral. Following completion of treatment sessions that contributed to the research project, Participant Three continued with psychotherapy treatment and was able to focus on further improving his interpersonal skills and reducing his levels of emotional over-sensitivity.

*Outcome Measure:* Participant Three completed seven treatment sessions following baseline conditions. See Figure 6.7, p. 102. The number of sessions was determined by ACC approved funding for this participant. Across both baseline and treatment sessions he rated himself as in the *normal* range for both the Anxiety and Depression Scales, with little variation in his scores. Given that Participant Three was not depressed or anxious at referral, it was not expected that his HADS scores would change across treatment sessions.

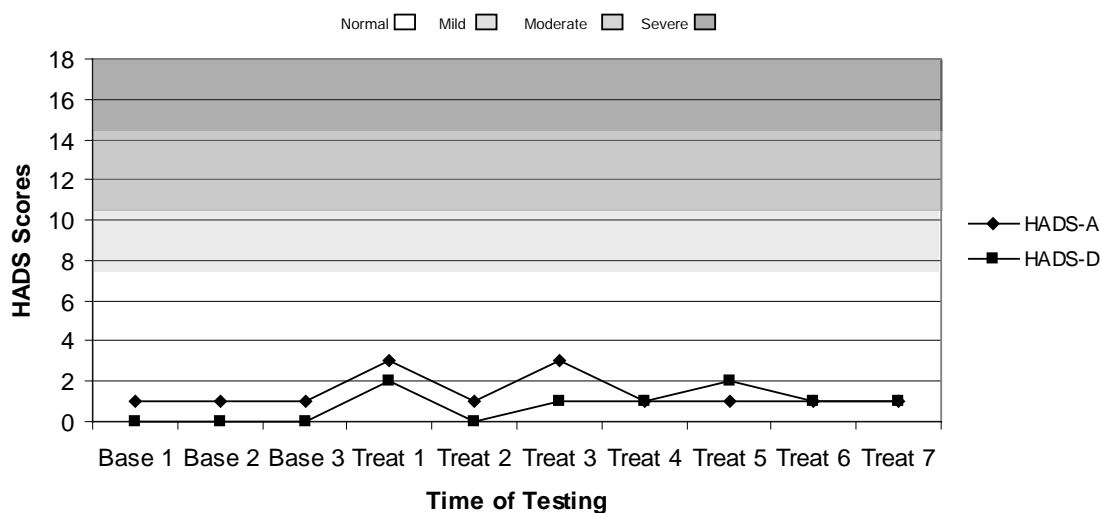


Figure 6. 7. HADS scores across baseline and treatment conditions for Participant Three.

Participant Three and his mother completed the PCRS at the commencement and conclusion of treatment sessions. See Figure 6.8., p. 103. Patient and Informant ratings

were highest for Cognitive Skills and lowest for Interpersonal Skills. Patient ratings were higher for Emotional Skills than for Activities of Daily Living; however, this order was reversed with Informant ratings. While Informant ratings highlighted difficulties for Participant Three in a number of specific emotional and interpersonal skills (e.g., getting help when confused, handling arguments with people I know well, and keeping my emotions from affecting my daily activities), initial Patient ratings suggested a lack of insight in these areas. Patient ratings for Interpersonal Skills and to a lesser extent, Emotional Skills, decreased across treatment sessions. This could have indicated an improvement into Participant Three's level of insight into his skills in the Interpersonal Area, with the difference between Patient and Informant ratings decreasing between commencement and conclusion of sessions. Informant ratings indicated declining skills across treatment sessions, with small declines in Activities of Daily Living and Cognitive Skills and more noticeable declines in Interpersonal and Emotional Skills. Informant ratings suggest that Participant Three's insight into his Emotional Skill levels did not improve across sessions. Age at injury impacts on outcome (Baron, 2004) with early diffuse lesions from TBI having more pervasive effects than later injury. Participant Three's young age at injury could have impacted on his ongoing ability to learn and to develop insight into his emotional reactions and the impact of his behaviour.

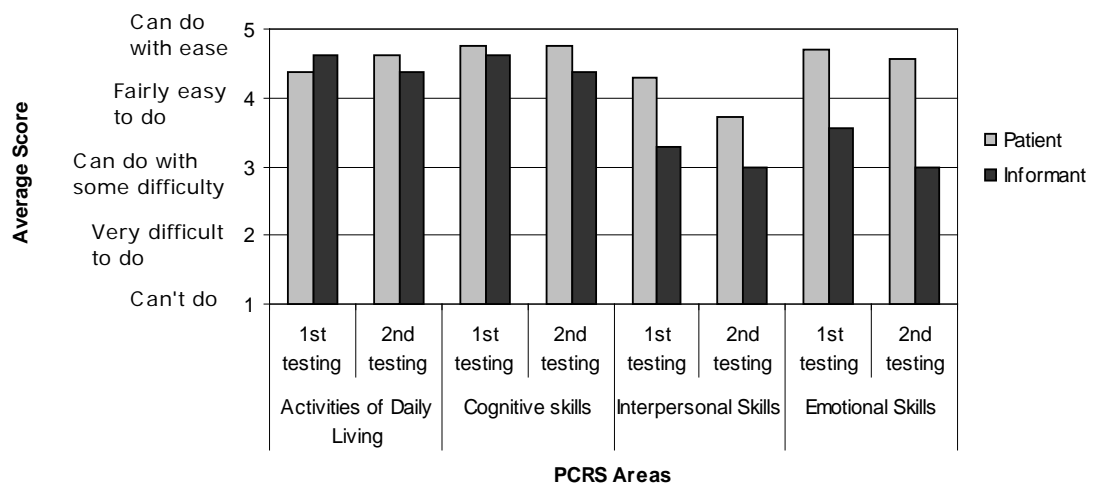


Figure 6. 8. Average ratings across PCRS areas for Participant Three.

Participant Four:

Participant Four sustained a TBI and serious physical injuries at 26 years of age when he fell from his motorbike. He was referred 20 months following his injury for psychological assistance in reducing his symptoms of depression, and reducing the impact of mood, pain and fatigue on his cognitive performance.

Participant Four's injury resulted in a loss of sensitivity and movement ability in his right arm, and extensive damage to his right knee and thigh with a need for skin grafts to repair tissue loss. Because of restricted movement in his limbs resulting from his accident, Participant Four was no longer able to ride a motor bike, which had previously been a major source of enjoyment. Prior to his accident Participant Four had a pronounced stutter and some obsessive tendencies which worsened after the accident. He described his memory as less reliable since his injury, and used his mobile phone as an organiser in order to compensate for this difficulty. Physical consequences from his injury included ongoing fatigue and pain, with pain in his lower back and right knee and phantom-like nerve pains in his right hand. An additional concern since his injury was weight gain as he had experienced a lessening of his mobility with his physical injuries. This in combination with his stutter led to lowered levels of social confidence.

Prior to his injury, Participant Four had worked in a clerical position in a private hospital and returned to this position following injury. While he was able to manage the work he did not find it to be challenging or rewarding. However, it provided income and he was not motivated to make changes at the time of treatment sessions. He was able to regain his mobility, transporting himself to work and around the city, by learning to drive a car that was specifically adapted to his levels of disability. Participant Four lived with his parents and expressed concern that his injury had resulted in increases in tension within the family. He initially worried that his injury could impact on his parents' health.

*Adaptation of Therapy Programme:* Early in treatment, sessions were lengthened from one hour to ninety minutes, in order to compensate for Participant Four's difficulty in communication due to his stutter. However, as his confidence improved the impact of his stutter lessened, and the extended length of sessions unnecessary.

An Activity Schedule was useful in identifying sources of enjoyment and frustration. Participant Four enjoyed playing online games and watching TV. This however, had the effect of delaying his sleep, in that he often did not fall asleep prior to 1.00 am, leaving him feeling tired and unmotivated the next day. A Sleep Diary over the course of a week showed that he obtained on average four hours sleep a night during the week and caught up with sleep over weekends. While he was able to identify that disadvantages of reduced sleep included being tired and unmotivated during the day, he valued being able to schedule the activities that he enjoyed and had not made changes to his sleep schedule at the conclusion of treatment sessions. He was able however, to reduce the level of antidepressant medication used to manage his pain and this improved his level of alertness during the day. Participant Four's frustration and irritability could be triggered by his need to prepare for activities that he did not particularly enjoy, such as attending the gym in order to manage his weight. While he was able to maintain attendance at the gym early in treatment sessions, he found it hard to maintain his level of motivation and his attendance dropped away. Participant Four was able to make good use of his folder in order to store handouts from treatment sessions and homework material and used his mobile phone as a compensatory strategy for memory difficulties, using it as a diary to store reminders and information, for example, to record the time spent at the gym when assessing his levels of exercise.

Thought Records were useful in identifying that Participant Four could easily become frustrated, angry and uncertain once situations or tasks became difficult, particularly when at work. At these times his thoughts included "Stop what I am doing and do something easy", "I am happier when I am alone". When at home he wondered "Does my situation upset my father?" He was able to challenge this thought by looking at alternative explanations including "He has just started a new challenging job" and "Things have improved since I first had my injury". Participant Four became uncomfortable in social situations, worrying that his stutter and increased weight would be noticeable to others. He expressed the belief "I am different to others".

A personal goal for Participant Four was to increase his levels of motivation. He was encouraged to acknowledge his achievements in returning to work, maintaining his ability to drive around the city, and being able to organise his daily activities. A problem solving approach was used in order to encourage him to explore his levels of

frustration with his current work situation and to identify changes. He was able to write to his manager outlining areas of frustration and found that other employees shared his work concerns. He identified that obtaining increased job satisfaction could involve finding a new position or completing study in order to upgrade his skills. However, at the conclusion of treatment sessions, Participant Four concluded that he would not pursue these changes as his current position had a number of advantages in being manageable and providing income.

*Outcomes:* For Participant Four, the short term nature of the therapy allowed for identification of problem areas, rather than implementation of solutions. Activity schedules and Thought records assisted in the identification of situations that triggered frustration and irritability, and allowed him to challenge personalisation of these events. His level of depressive symptoms remained in the *moderate* to *severe* range across treatment sessions. He continued to experience a lack of confidence in social situations due to his stutter and increased difficulties in managing his weight. He was however, able to reduce the amount of antidepressant medication used to control his pain without an increase in his level of depression and this improved his level of alertness during the day. Participant Four was able to develop compensatory strategies to assist with memory, using his mobile phone for recording information and as a diary. While he was able to acknowledge that he had made gains in being able to regain his independence with work and transport, motivation remained an issue across sessions with maintaining an exercise programme, addressing lack of satisfaction in his work situation, and in readjusting his sleep pattern in order to further reduce his levels of fatigue during the day.

*Outcome Measure:* Scores on the HADS-A Scale were in the *mild* to *normal* range at baseline with an average score of 8.00. See Figure 6.9., p. 107. Over treatment sessions these scores remained in the *normal* range, with a reduced average score of 6.00. His scores on the HADS-D Scale were in the *severe* range at baseline with an average score of 16.33. Depression scores were increasing over baseline conditions. During treatment conditions, the average Depression score was 14.75, with a slight reduction from baseline. The trend line for treatment scores demonstrated a stabilisation of scores

with a slight overall reduction. Depression scores over treatment were in the *moderate* to *severe* range.

Participant Four completed the PCRS at the commencement and conclusion of treatment sessions, with the Informant version on both occasions being completed by his mother. See Figure 6.10., p. 108. At the commencement of treatment sessions, Patient ratings were highest for Activities of Daily Living followed by Cognitive Skills, whereas this order was reversed in Informant ratings. At the conclusion of sessions, Patient ratings for Activities of Daily Living and Cognitive Skills were at the same level, whereas Informant ratings were higher for Cognitive Skills. For both Patient and Informant ratings, Interpersonal and Emotional Skills continued to rate as areas that were hard to manage. Participant Four overestimated his abilities on Activities of Daily Living on both times of testing as compared to his mother's ratings, and regarded his skills as increasing over the time of treatment, where she did not see a change. There were also discrepancies between Patient and Informant ratings on Cognitive Skills, with Participant Four rating his cognitive skills initially at a lower level, but then increasing over time, whereas, his mother rated a slight decrease in these skills. There was closer agreement between Interpersonal and Emotional Skills between ratings with Interpersonal Skills demonstrating a slight decline, and with little change in Emotional Skills across treatment.

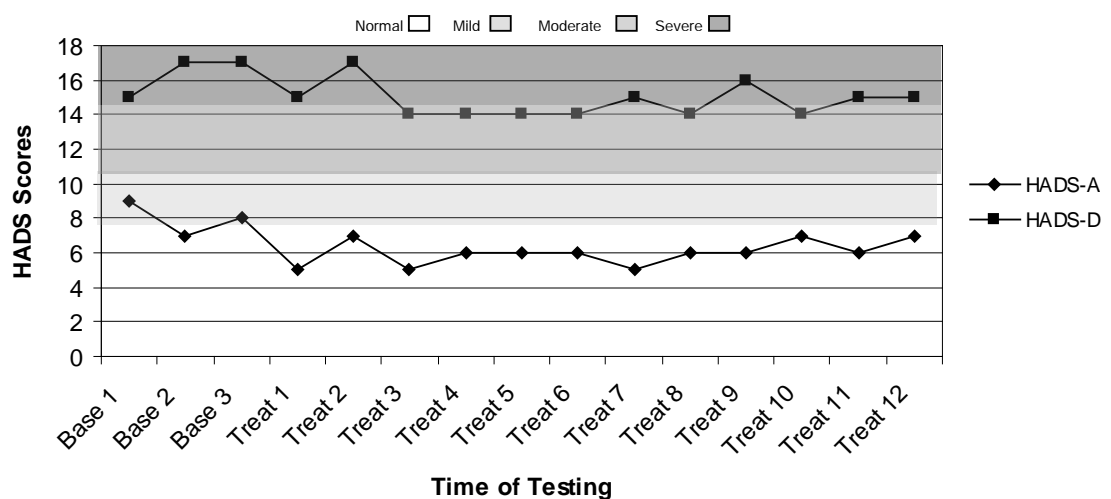


Figure 6. 9. HADS scores across baseline and treatment conditions for Participant Four.



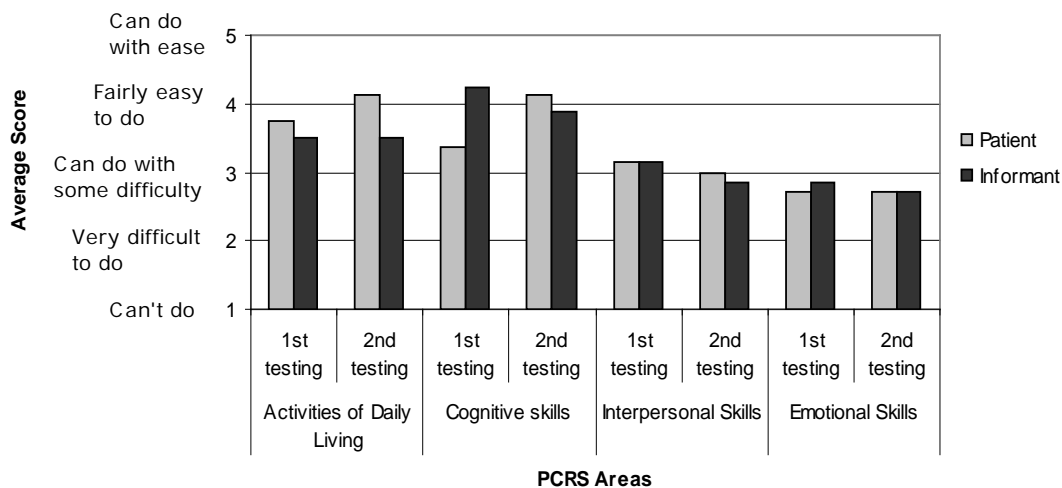


Figure 6.10. Average ratings across PCRS areas for Participant Four.

Participant Five:

Participant Five sustained a TBI at age 28 in a motor vehicle accident. His referral, 19 years after his injury, was for education around the consequences of TBI, and for assistance with management of fatigue, pain, low mood and anxiety. His ability to manage employment was compromised by cognitive difficulties including impairments in memory, attention, information processing speed and visual spatial abilities.

Prior to his injury Participant Five worked as a Service Coordinator and was capable in a number of trade areas. After the injury, he obtained work in a service capacity, in maintenance of machinery. He experienced ongoing difficulties with his work, in part due to health conditions. Pain in his knee, tailbone and lower back made it hard for him to sustain regular hours and led to extended periods of time off work. Sleep difficulties and fatigue had been problematic over a number of years. Cognitive difficulties with concentration and attention, processing speed and memory impacted on his ability to do his job well. His decreased levels of efficiency caused him ongoing concern, and he often charged for fewer hours than he put in. His manager noted that Participant Five often experienced mental blocks, unsure as to how to proceed. These problems worsened when he was experiencing pain. He had difficulty in following checklists and his work was inconsistent. Following injury, Participant Five’s belief that he could still do the same trade jobs as prior to injury, was not borne out by his practical performance. While he was a loyal, motivated, hard working employee, he had difficulty in sustaining

a consistent level of work. He demonstrated a tendency to take on more than he could manage, overestimating what he was capable of, and underestimating how long it would take, in a desire to please others. His fatigue, exacerbated by poor sleep, resulted in reduced efficiency in the work place and at home. He could be irritable, snapping at his wife and family. He was aware that when he was under stress he was more likely to be intolerant and difficult to live with.

*Adaptation of Therapy Programme:* Participant Five identified goals for treatment including improving his ability to recognise signs of stress and fatigue early, improving his sleep, reducing his levels of anxiety and managing his chronic pain. In sessions Participant Five brought a donut pillow to sit on during sessions to manage pain in his tailbone. Discomfort to his lower back was also evident during treatment. Mid way through sessions, his knee gave way while he was out on a job and he took a four week gap in sessions while having surgery.

Education was provided about consequences of TBI, which assisted in providing context for the difficulties Participant Five encountered in the work situation, for example, finding it difficult to comprehend a long list of instructions. A useful compensatory behavioural strategy was to break work tasks down into a series of steps and to complete one task at a time. He was able to use the decision making strategies to prioritise work requirements, and to decide to leave a task even if it was not completed fully to his satisfaction.

Thought records revealed that Participant Five had perfectionist tendencies. He also had a pattern of working for a period and then “crashing”, being unable to manage work for a few days. During treatment sessions he was able to identify warning signs that had signalled crashes in the past, including being busy, having problems in sequencing at work, and having an accident at work. He had avoided a “crash” by using the Thought Records which enabled him to identify his catastrophic thoughts when his anxiety symptoms increased, due to his inability to meet his personal work expectations. Additional strategies had included learning problem solving skills and reality-checking. He still, however, struggled to maintain a good life balance. While treatment sessions focused on increasing his level of insight in this area, at the conclusion of sessions there was still concern that he would not make the appropriate changes needed in order to

manage his fatigue and the resultant difficulties with attention, concentration and the mistakes that occurred when he was tired. His difficulties with sleep did not improve over the course of therapy. Introducing a sleep module into the CBT programme could potentially have been beneficial for Participant Five. His treatment sessions concluded once the number of ACC funded sessions came to an end.

*Outcomes:* Treatment sessions for Participant Five focused on increasing his awareness of his tendency to overdo things and the impact that fatigue had on his cognitive efficiency. He made progress in learning skills that could assist him to manage his life in the face of reduced cognitive abilities, for example, in breaking tasks down into a series of manageable steps. Thought records helped him to identify his catastrophic cognitive patterns and to test these out. He had however, ongoing risk factors that could impact on his ability to use these skills. These included his perfectionist tendencies that led him to do and redo his tasks; having difficulty in accepting that he could not work at the same standard as prior to his injury; and his strong sense of loyalty to his job and his desire to do his best. Often he did not perform at an optimum level at work, and tended to work for four days instead of his scheduled three, which reinforced a cycle whereby he regularly reached burnout. His sleep difficulties did not improve over the course of sessions. It was recommended that he only increase his hours at work when he was able to manage three days effectively. His well intentioned efforts to give as much as possible to his boss in gratitude for his support tended to hinder his overall progress.

*Outcome Measure:* At baseline, Participant Five's scores on the HADS-A Scale were at the high end of the *moderate* range with an average of 12.67. See Figure 6.11., p. 111. Over the course of treatment sessions these reduced to the *mild* range with an average of 11.00. On the HADS-D Scale, scores at baseline were in the *moderate* range with an average of 11.00. Over treatment sessions, these varied with a reducing trend to finish in the *mild* range with an average of 9.78. At baseline, scores on both the Anxiety and Depression Scales indicated a decreasing trend. This decreasing trend continued over treatment sessions.

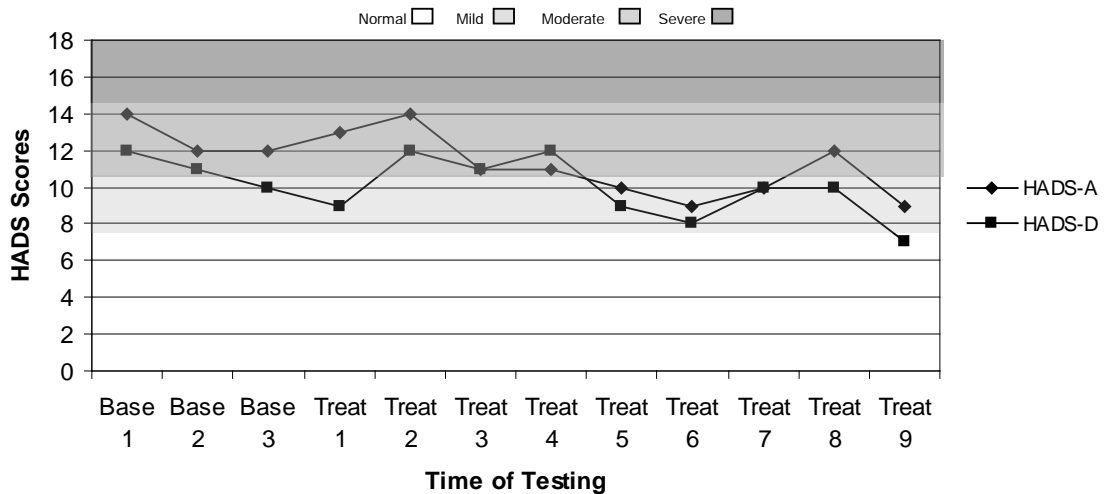


Figure 6. 11. HADS scores across baseline and treatment conditions for Participant Five.

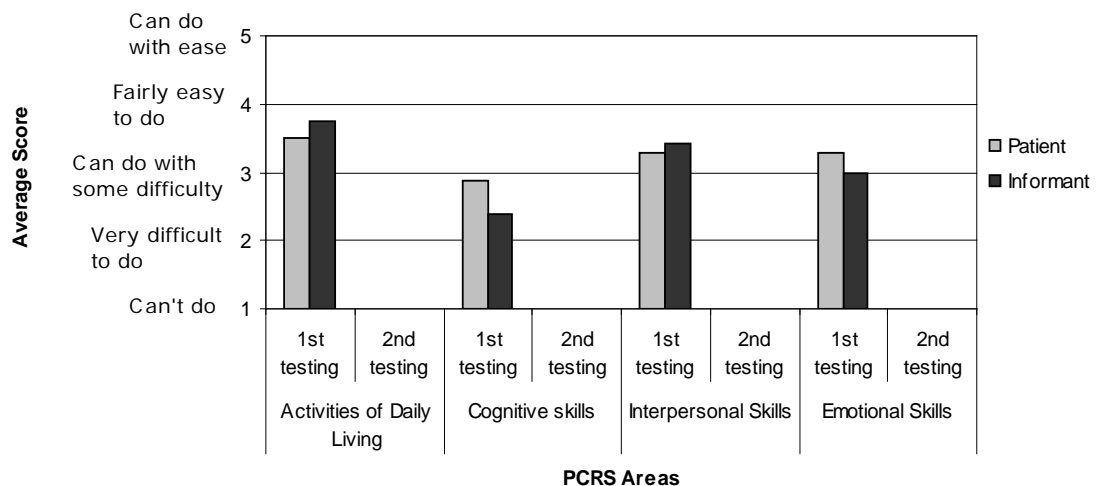


Figure 6. 12. Average ratings across PCRS areas for Participant Five.

The PCRS was completed at the commencement of treatment sessions, with the Informant version for Participant Five completed by his wife. See Figure 6.12., p. 111. Difficulties with memory and organisational strategies meant that ratings were not completed at the conclusion of treatment sessions. Patient and Informant ratings scored Activities of Daily Living at the highest level, followed by Interpersonal, Emotional then Cognitive Skills. The greatest difference between Patient and Informant ratings occurred for Cognitive Skills, with Patient ratings providing higher ratings of abilities as compared to Informant ratings. Patient ratings indicated that it was difficult for him to

remember important things that he needed to do, start conversation in groups and remain involved in work activities when he was tired or bored. Informant ratings noted that he could also find it difficult to understand new instructions, meet daily responsibilities, and manage his temper when upset.

Participant Six:

Falls are the second leading cause of brain injury (Kraus & Chu, 2005). Participant Six sustained his TBI when he fell from a ladder while working on his house. The injury resulted in contusions in his frontal, temporal and parietal lobes and subsequent post-injury seizures. At the time of his injury, he was 47 years of age. He was referred two and a half years after his injury for psychological assistance in managing a graded return to his work position and learning to increase his level of adaptability when encountering demanding situations.

Prior to his injury, Participant Six was an administrator and senior Secondary School teacher managing the requirements of his position as they arose without the need for prior planning. Following his injury, he found managing complex tasks difficult. He tended to set high standards and evaluate himself in a negative fashion, comparing his post- and pre-injury performance. Physical consequences arising from his injury included headaches and high levels of fatigue, which had impacted on his initial attempts to return to part time work in the year immediately following his injury. His post injury seizures prevented him from making a return to driving. Cognitive consequences included impaired concentration, slowed information processing speed and difficulties in planning his activities. He could experience mental blocks to finding alternative ways of solving problems, and found it difficult to adjust to changes in daily routines. He returned to work in a part-time capacity, with some responsibilities in staff support, but needing to relearn his subject and spending 30 – 40 minutes planning each one hour teaching session. He struggled to maintain his work effort in the afternoons and evenings, finding that fatigue reduced his cognitive effectiveness, leading to blocks in his thinking processes. While neuropsychological assessment revealed that his skills were mostly in the *average* range, this represented a decline from previous levels and represented a source of frustration in his work position where he was expected to perform at a high level of efficiency. He demonstrated high levels of perfectionism

with respect to his job performance, finding it hard to accept standards that were less than perfect with tasks such as classroom management, marking and exam preparation.

There was an increase in the level of tension within Participant Six's family following his injury, particularly with his communications with his wife, whose responsibilities had increased since his injury, and with his eldest son. He found it difficult to accept that fatigue had a major impact on his ability to manage his responsibilities, and compensated for not feeling in control of various situations by becoming over-controlling and inflexible in his approach, which increased conflict within the family.

*Adaptation of Therapy Programme:* Participant Six found it necessary to reschedule sessions on a number of occasions when his fatigue levels were high. Due to driving restrictions arising from his ongoing vulnerability to seizure activity, sessions were held at his home following the end of his work day at school. Provision of educational material provided validation of his experiences of fatigue, and difficulties with attention and organisational skills.

According to the Activity Schedule Participant Six commenced his days early, often rising at 5.15 am, as he worked more effectively then. Analysis of situations where he felt at a loss as to how to proceed revealed that his performance and subsequent confidence were related to the time of day, fatigue, experiencing changes in scheduled activities, and having high personal expectations of his performance. Techniques that helped to reduce distraction and confusion were using earplugs to block out distractions, and discussing concerns with colleagues. He was aware that classroom situations could not always be anticipated in advance and spent time making back-up plans for when difficulties could arise. Participant Six was encouraged to adopt a "paced" approach to his activities, scheduling rests prior to the onset of fatigue, and reducing the number of tasks he expected to complete at times when fatigue was an issue. He learned relaxation strategies to assist with the management of fatigue, and gave consideration to appropriate times to practise these.

Thought Records revealed that Participant Six had a tendency to judge his achievements in a critical manner, for example when he was not able to pick up new learning in as rapid a fashion as prior to his injury. He was able to challenge these criticisms by

recognising that he would be able to return to the learning and pick skills up in a gradual fashion. As well as using Thought Records in sessions, Participant Six used his work diary throughout each week in order to record and identify themes around his thinking patterns and emotional reactions to stressful situations. A key factor in his return to work was his unwillingness to accept his high levels of fatigue. Participant Six now regarded himself as “just a worker ant”, having lost influence and status as compared to before his injury. He was able to identify that taking time out with his family could be helpful in allowing him to regain a sense of perspective.

*Outcomes:* Participant Six demonstrated a high level of motivation across treatment sessions, particularly with regard to returning to full time work in a combined teaching and management role in 2008. Across treatment sessions he focused on a graded approach, increasing his hours in the classroom and his level of responsibility by assisting with the professional development of other teachers. He identified that fatigue remained a barrier to achieving his goals, particularly his fatigue levels in the afternoons and evenings. Other difficulties included his decreased planning and organisational abilities as compared with prior to his injury. He was able to identify compensatory strategies, including scheduled rest periods, techniques for reducing distraction, discussing issues with colleagues, and making time to spend with family. Cognitive techniques assisted in challenging his tendency to judge himself in a highly critical manner. His greatest area of difficulty was in accepting his need to allow for his high ongoing levels of fatigue. At the conclusion of treatment sessions he reported a high level of confidence in his ability to manage his work in the following year; however, a referral was made for further psychotherapy sessions to support him in this process.

*Outcome Measure:* Across the course of baseline and treatment sessions, Participant Six's scores on the HADS Anxiety and Depression Scales remained in the *normal* range. See Figure 6.13., p. 115. At baseline his average score on the Anxiety Scale was 4, reducing to an average of 3.67 over treatment sessions. His Depression score at baseline averaged 5, reducing to 3.78 over treatment sessions. At baseline, his Anxiety scores were decreasing, and continued to decrease at a slower rate over treatment sessions. At baseline his Depression scores were stable. These decreased over treatment sessions.

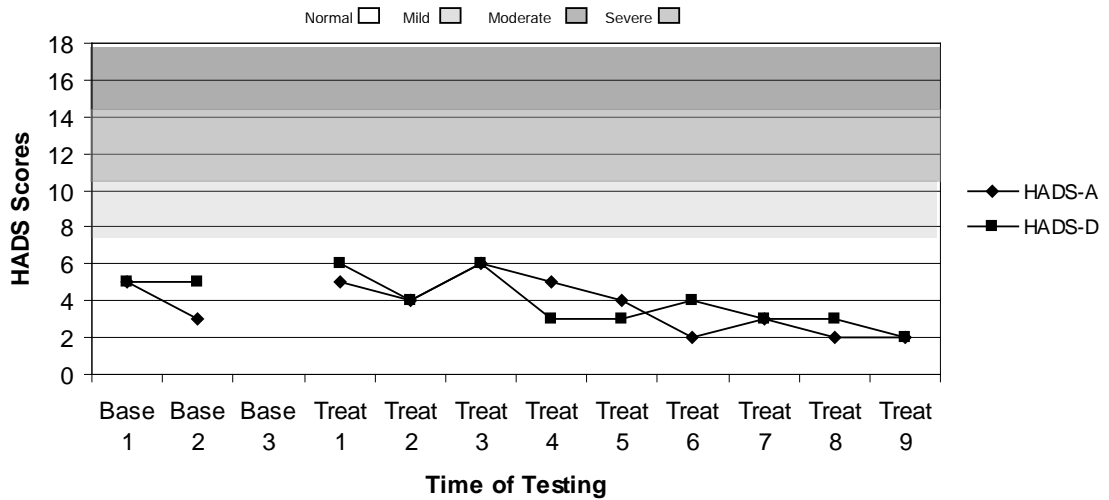


Figure 6. 13. HADS scores across baseline and treatment conditions for Participant Six.

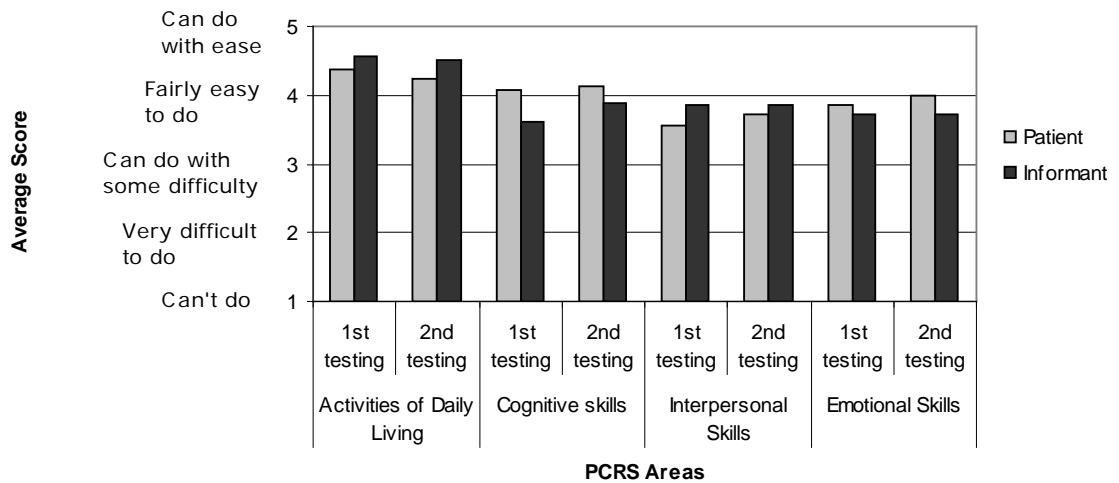


Figure 6. 14. Average ratings across PCRS areas for Participant Six.

The PCRS was completed at the commencement and conclusion of treatment sessions occasions by Participant Six with his wife completing the Informant version. See Figure 6.14., p. 115. At both times of rating Participant Six rated himself most highly on Activities of Daily Living, followed by Cognitive Skills, Emotional Skills, then Interpersonal Skills. Informant versions rated him most highly on Activities of Daily Living, followed by Interpersonal Skills, Emotional Skills, then Cognitive Skills at the first time of rating. The largest discrepancy between Patient and Informant ratings was between Cognitive Skills at the initial time of rating. Informant ratings suggested that



Participant Six's Cognitive Skills improved slightly over the time of treatment sessions. Informant ratings identified Participant Six's greatest ongoing difficulty as his ability to adjust to unexpected changes.

Participant Seven:

When she was a 16 year old secondary school student, Participant Seven sustained a TBI in a motor vehicle accident, while driving a borrowed car. The injury resulted in damage to the left temporal and occipital lobes. She was referred for psychological assistance five years after her injury in managing high levels of fatigue, which had impacted on her ability to return to either her studies at school or to commence further training courses, and to learn techniques for managing her increased tendency to worry about her daily responsibilities.

In the year following her injury Participant Seven made an attempt to commence a Design course. However, she found this to be unsustainable due to her fatigue, headaches and her difficulties in understanding and keeping up with the work. Her ongoing levels of fatigue were her most pressing concern following her injury. Fatigue impacted on her levels of social interaction as she found it difficult to manage additional activities in the evenings or weekends. Her friends and acquaintances found it difficult to understand her need for rest and made critical comments about her lack of stamina. Cognitive difficulties that were evident following injury included impairment of short term memory and concentration, slowed information processing speed and problems with organisation and planning. Participant Seven was enrolled in a training course that aimed to prepare young people with skills that they could transfer to the workplace. Her course tutors were flexible in their approach to her attendance, encouraging her to attend morning sessions and to extend her attendance into the afternoon where possible. She had strong support from her family, in particular, her mother, grandmother and brother. As well as attending the training course, she worked in a voluntary capacity with her grandmother at a Hospice Shop on Wednesday afternoons, and went swimming on Friday mornings with her grandmother and friends. She also managed household activities such as laundry and cooking, and looking after her cats and dog. Her mother and grandmother remained aware of her need to obtain rest and to manage her fatigue levels.

*Adaptation of Therapy Programme:* Sessions were held at Participant Seven's home as she was unable to drive herself, did not have access to transport and did not have family members who were available to drive her during the week. She was prepared and ready for each session, eager to discuss her progress over the week. She demonstrated strong motivation to learn ways of managing her fatigue and tendency to worry. Her mood during sessions was generally positive, although she could appear anxious if she had something on her mind or was particularly fatigued.

The main focus of treatment sessions was on assisting Participant Seven in management of her levels of fatigue. Educational material provided validation of her experience of fatigue following injury. She was introduced to the technique of pacing her activities, by determining a sustainable level of course attendance and then increasing this in a gradual fashion. Activity Schedules showed that she was able to attend her training course in the morning and on occasion extend this until 2.00 pm. Across treatment sessions, it proved difficult for her to extend these hours further. She was able, however, to maintain her voluntary activities and swimming. She found that she was more able to manage physical as compared to mental activity. She was encouraged to take rest breaks before becoming fatigued, or to change to less challenging tasks. Towards the end of treatment sessions, she commented that her greatest challenge was to recognise the onset of fatigue before it became unmanageable. She learned to schedule rest and recovery time into her week and found that having naps at the weekend was useful. She used compensatory strategies to assist with her memory and concentration, tackling tasks involving high attentional demands in the morning when she was less fatigued, and using enriched processing techniques and visualisation to assist with memory.

As a homework task during treatment sessions, Participant Seven completed an artwork that expressed her experience of her injury, contrasting the clear direction and confidence she had pre-injury with her slowed progress and adjusted aims following injury. Prior to her injury she was confident to go into Wellington with her friends from her own peer group. She was able to sew her own clothes. Following the injury as a result of high fatigue levels she felt more comfortable in going swimming with her grandmother and her older friends who were more understanding of the impact of

fatigue. She focused more on maintaining her clothing, being able to manage laundry as opposed to the more challenging tasks of sewing. The injury is illustrated by a dramatic lightning strike that provides a sharp division between the two different perspectives that she had of herself. See Appendix 5, p. 251.

Participant Seven had a tendency to worry. Thought Records allowed her to see she thought that others would judge her in a negative fashion, for example, when looking after a neighbour's cat that made a mess of a pot plant, her thoughts were "She'll think that I'm to blame". She was able to challenge these thoughts by taking a more realistic view with "She'll think that I've made a good effort". Testing out these alternative thoughts revealed that her neighbour was not upset by her cat's behaviour. Participant Seven expressed the Intermediate belief "If I don't worry I will not be organised" and a core belief "I will not be employable in the future". Participant Seven learned techniques to assist with worry, finding it useful to set aside times to deal with worries, applying a problem solving approach to specific worries, and then to set problems aside until she was able to implement her solutions. She also learned to focus on specific worries for a period, then to let them go in the same way that a train stops at a station, and then moves on once passengers have been able to continue with their journeys.

*Outcomes:* Educational material provided Participant 7 with validation of her experience of fatigue. She was able to apply pacing techniques to increase her level of functional activity by moving from challenging to less challenging activities while at her training course when noticing the onset of symptoms of fatigue. She learned to proactively schedule rest times, using weekends as a time to catch up on sleep. Cognitive techniques assisted in the management of persistent worry. Thought records identified that she was concerned that others would judge her in a negative manner. She was able to challenge these perceptions by adopting a more realistic outlook and testing out these alternative predictions. Participant Seven found problem solving approaches to be useful, along with the use of specific times to focus on addressing worries. At the conclusion of treatment sessions, fatigue levels remained high. In attempting to find a part time position in 2008 she was encouraged to seek work in the morning, initially on two to three days per week, extending her hours only once she was able to manage this on a regular basis. Her mother supported this graded approach to resuming work

activities. Participant 7 was also encouraged to spend some time on relaxing activities that she enjoyed, for example, in Art or Craft activities.

*Outcome Measure:* Participant Seven obtained HADS Anxiety scores in the *mild* range across baseline and treatment conditions. See Figure 6.15., p. 119. Her average baseline Anxiety score was 9.00, reducing slightly to an average of 8.33 over treatment. Her average baseline score on the Depression Scale was 4.00, increasing slightly to 5.00 across treatment sessions. Depression scores were in the *normal* range across both baseline and treatment conditions. Since the focus of her referral was for management of fatigue and worry it is not surprising that there was little impact of the intervention on levels of Anxiety and Depression as measured by the HADS.

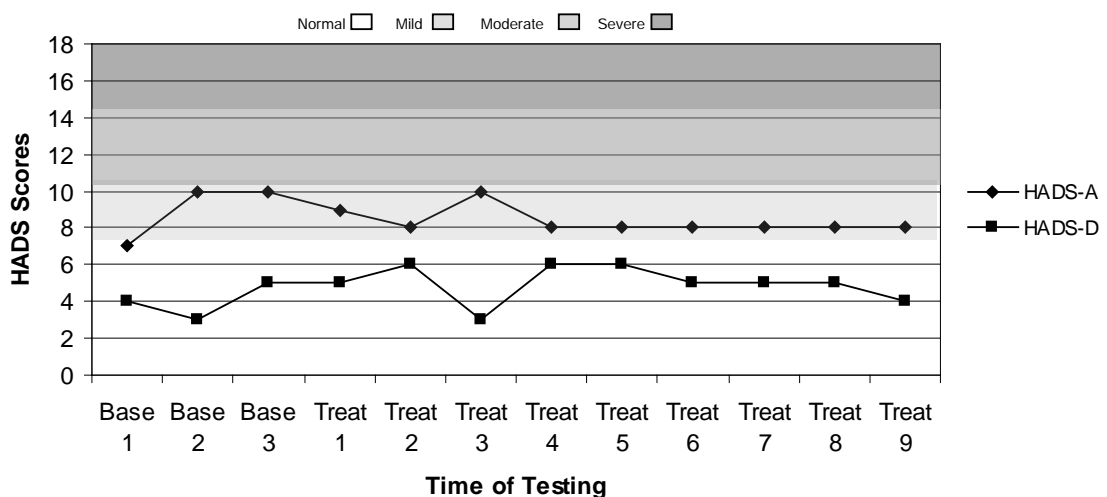


Figure 6. 15. HADS scores across baseline and treatment conditions for Participant Seven.

Participant Seven completed the PCRS at the commencement and conclusion of treatment sessions, with the Informant versions completed by her mother. See Figure 6.16., p. 120. Patient and Informant ratings at both times of testing placed Interpersonal Skills at the highest level and Cognitive Skills at the lowest level. Participant Seven's ratings indicated that Cognitive Skills were perceived to improve over the course of treatment sessions. Her mother scored Activities of Daily Living higher than Emotional Skills at both times of rating, whereas, Participant Seven initially scored Activities of

Daily Living higher than Emotional Skills, reversing this at the completion of treatment sessions.

At both the commencement and completion of treatment sessions there was little difference between Patient and Informant ratings. At commencement of sessions there were only two questions with ratings that differed by two points, involving “remembering names of people that I see often” with Participant Seven indicating more difficulty and “accepting criticism from others” with her mother indicating the greater degree of difficulty.

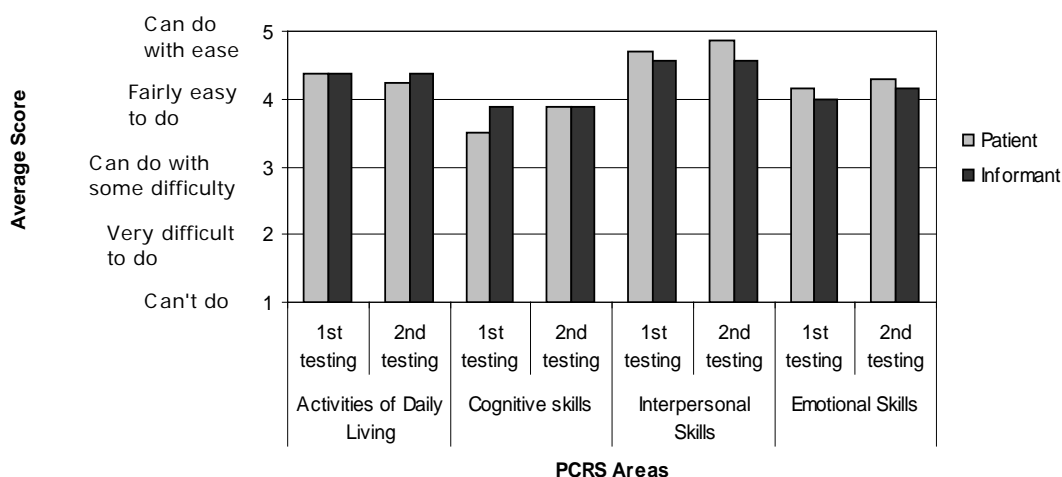


Figure 6. 16. Average ratings across PCRS areas for Participant Seven.

Fatigue levels remained high for Participant Seven across most treatment sessions. Her level of Fatigue and pain arising from headaches was assessed using Subjective Units of Distress (SUDS) across most treatment sessions. SUDS ratings were rated from 0 – 10 where 0 represented no noticeable fatigue/headache, and 10 represented worst ever fatigue/headache. See Figure 6.17., p. 121. Higher fatigue ratings were associated with having swollen glands at Treatment sessions 3 and 4, and having an increase in the number of commitments involving mental activity at Treatment session 7. Headaches occurred in an intermittent pattern and formed a less pervasive problem than fatigue.

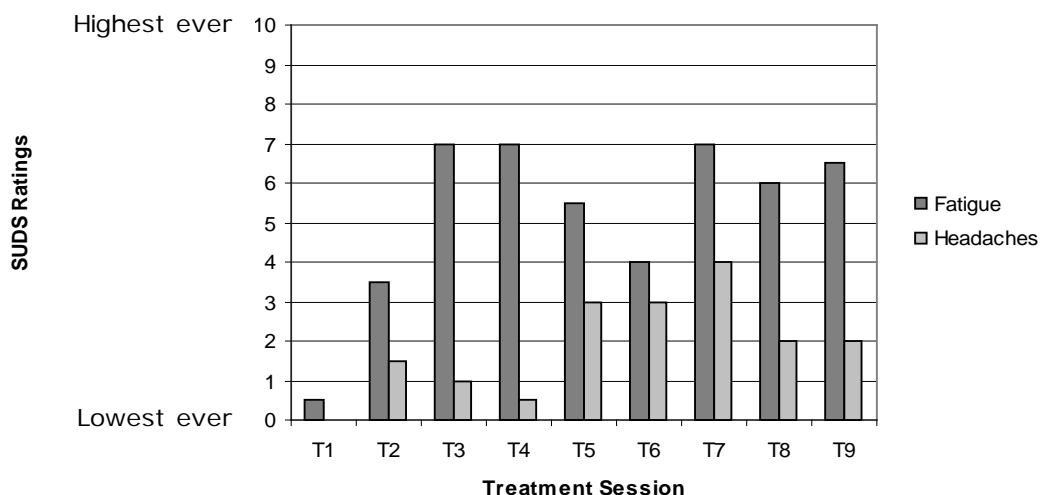


Figure 6. 17. SUDS ratings for fatigue and headaches for Participant Seven.

#### Participant Eight:

Participant Eight sustained a TBI when his truck jack-knifed, flinging him from one side of the cab to the other and knocking his head in the process. At the time of his injury, he was 55 years of age. 15 months after his injury, he was referred for psychological assistance in managing his pain levels, episodes of low mood that followed the accident and the cognitive sequelae that resulted from his brain injury. In the accident, his teeth were smashed and he sustained physical injury to his neck and shoulder which resulted in ongoing nagging pain.

Of Maori descent and from the Tuwharetoa Iwi, Participant Eight was born in the central North Island region of New Zealand. He described an enjoyable early childhood, with fair but firm discipline from his father. Following the break up of his parents' relationship, he was taken by the authorities and placed with relatives in Wellington. He was bitter about these events, describing his living situation in Wellington as abusive. He was unable to settle in school, experiencing difficulties in learning, and became involved in gang culture. He reported not learning to read until the age of 26 years. In more recent years he had distanced himself from gang associations. He obtained steady employment as a truck driver and completed a University qualification in Computer studies. At home he spent much of his spare time working with his computer. He lived in Wellington with his partner and their two sons.

The main presenting problem for Participant Eight was the persistent pain that had followed his injury. This pain extended over his forehead, the back of his head and down his left shoulder and arm. He only obtained relief from the pain when asleep. Since the injury he had difficulty in maintaining his concentration, in taking in what others were saying, remembering his daily commitments, and in recalling what he had been told. He also experienced frustration and low mood, finding it difficult to calm down once upset. He found noise to be distressing, a problem not evident prior to the injury. He lasted only three days in an attempt to return to driving following the injury, finding the noise of the cab to be intolerable, previously a normal component of his job. He expressed concern over not being able to provide a steady income for his family following his injury.

Participant Eight demonstrated ongoing difficulty in communicating with the agencies providing him with assistance. He was sensitive about his treatment by others and found it difficult to control his temper once upset, at times becoming verbally abusive. He had difficulty managing his time, often forgetting appointments, which exacerbated his difficulties in obtaining assistance. In treatment sessions he often appeared uncomfortable, needing to move frequently and take breaks outside in order to manage his pain. He gave the appearance of being constantly restless and on occasion wondered whether he had suffered from ADHD as a child. While he engaged in discussions during sessions, and expressed appreciation of the assistance and educational material provided, he found it difficult to remember homework activities or to fully understand the purpose of these. He took home ideas from discussion and claimed to implement these but in his own way - for example, by using his own form of relaxation technique. It was difficult to determine how effective these efforts were in assisting him with his overall treatment goals.

*Adaptation of Therapy Programme:* Across treatment sessions Participant Eight demonstrated ongoing difficulties in memory and organisational abilities. At the initial assessment session he was willing to take part in the research study, expressing approval for research into the psychological impact of TBI. However, his ongoing cognitive difficulties impacted on his ability to complete assessment requirements and homework activities. While he completed the HADS at the initial assessment session, he did not complete other baseline measures, which were provided for him to complete at home

and return at the initial treatment session. He was provided with a folder to use across treatment sessions, but did not remember to bring this to sessions or to use it to store educational handouts. One session was held at his home, and this provided the opportunity to check his folder. Contact was made with his partner towards the end of treatment sessions, and she was able to ensure that his handouts were filed and that he completed one administration of the PCRS. Participant Eight experienced difficulty in interacting with healthcare providers due to his confrontational interpersonal style. He initially experienced difficulties in receiving assistance with obtaining dental treatment and physiotherapy training in the use of a Tens machine in order to relieve his pain. While he was eventually able to successfully access dental treatment, the physiotherapy was less successful due to his difficulties in attending scheduled appointments on time and in managing his temper outbursts once confronted about this issue.

Participant Eight was provided with TBI educational material and also material that helped to provide insight into pain processes, such as cycles that maintain the experience of pain. He commented that he appreciated receiving TBI educational material as it helped him to make sense of the increased difficulties that he had with memory, concentration and organisational abilities since his accident.

Participant Eight found difficulty in using Thought Records, finding it hard to identify emotional reactions and the Automatic Thoughts that accompanied these. Treatment sessions had a main focus on management of pain, using a CBT approach described in Cole, MacDonald, Carus and Howden-Leach (2005), including adopting a pacing technique that emphasised a sustainable pattern of activity, and taking rest breaks prior to the onset of pain in order to avoid burnout. Participant Eight reported that he was able to use this technique in order to manage his sessions working on his computer and when working on family land one weekend up in the central North Island.

*Outcomes:* Participant Eight expressed appreciation of the validation of his post-TBI and pain experiences provided by educational material. His ongoing experience of pain and irritability impacted on his cognitive efficiency and organisational skills which in turn impeded progress towards successful pain management and improvement in his ability to manage his daily responsibilities. Across treatment there was limited impact on anxiety and depressive symptoms as measured by the HADS. While Participant



Eight reported using pacing techniques to assist with managing computer activities, and using relaxation strategies, it was difficult to assess whether he used these in a proactive manner in order to minimise the onset of pain episodes. Although he was able to engage in psychotherapy sessions, it was difficult to determine whether he fully understood the purpose of therapy interventions. His confrontational interpersonal style impeded his ability to receive assistance from a number of provider organisations. Additional treatment sessions that engaged the assistance of his partner could have been useful in improving his ability to manage daily commitments.

*Outcome Measure:* At the commencement of treatment sessions, Participant Eight's score on the HADS Anxiety Scale was at the high end of the *moderate* range. At the conclusion of treatment this had decreased to fall in the low end of the *moderate* or in the *mild* range. See Figure 6.18., p. 125. He experienced anxiety about his levels of pain and his eventual ability to return to work and provide an income for his family. His scores on the HADS-D scale remained generally in the *mild* range, rising on one occasion to the *moderate* range. As he continued to find his levels of pain to be distressing across the course of treatment sessions, this limited the change in his scores on the HADS-D and HADS-A scales.

Participant Eight completed the PCRS on one occasion towards the end of treatment sessions, with his partner completing the Informant version. See Figure 6.19., p. 125. Both Patient and Informant ratings scored his Activities of Daily Living as being higher than other areas, followed by Emotional, Interpersonal then Cognitive Skills. For all of the PCRS Areas, Patient ratings were lower than Informant ratings, with Participant Eight rating himself as "can't do" with a number of activities, including taking care of his finances, keeping appointments on time, scheduling activities, remembering important things that he needed to do, handling arguments, accepting criticism and controlling his temper when upset. These ratings were supported by observation of his difficulties across treatment sessions. Emotional and interpersonal difficulties may be less evident to family members than to the person with TBI (Leathem et al., 1998).

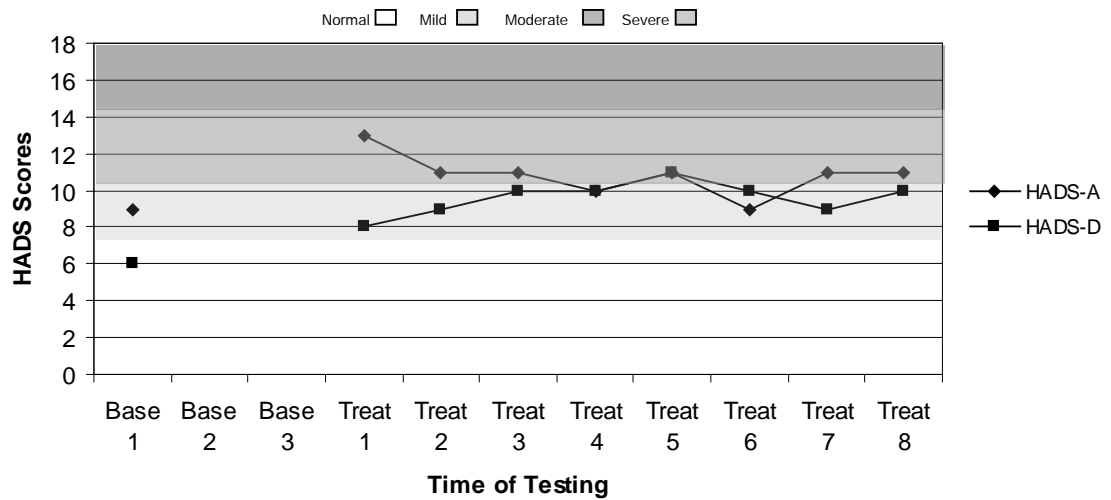


Figure 6. 18. HADS scores across baseline and treatment conditions for Participant Eight.

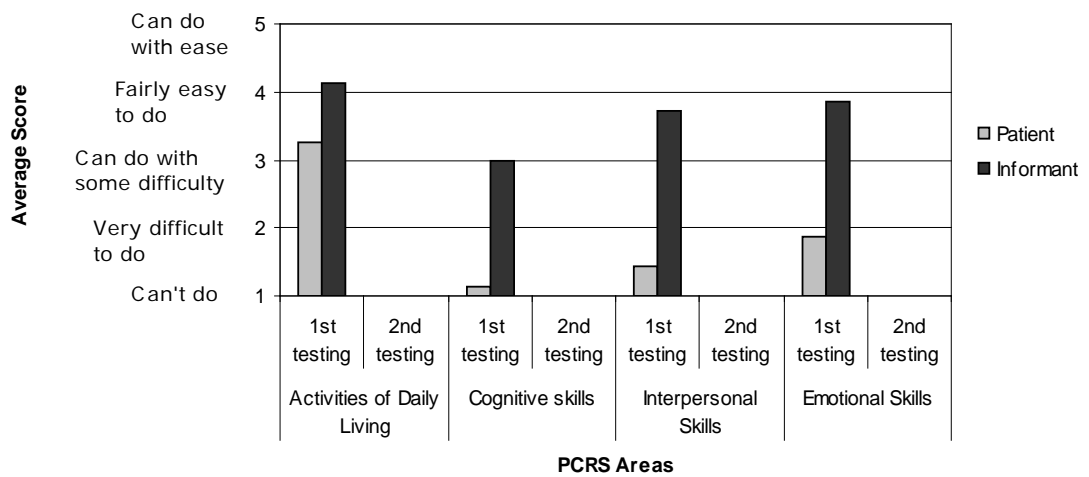


Figure 6. 19. Average ratings across PCRS areas for Participant Eight.

The Tampa Scale for Kinesiophobia (Kori, Miller, & Todd, 1990) was used to assess Participant 8’s level of anxiety and avoidance around his experience of pain. This revealed that he had considerable anxiety around his ability to move freely and to maintain activity. His score on this scale was 50, a *high* score (a score of 37 distinguishes between *high* and *low* scores). His continuing experience of pain across treatment sessions appeared to limit the impact of the CBT intervention on reduction of HADS scores on Anxiety and Depression.

ADHD has symptoms that can present in a similar manner to TBI, with difficulty in maintaining concentration, a pattern of impulsive behaviour and difficulties in organising daily activities. Participant 8 had noted that he suspected that he had ADHD as a child and that these characteristics had continued into his adult life. For a diagnosis of ADHD, it is necessary to demonstrate that symptoms were present prior to the age of seven years (American Psychiatric Association, 2000). It was not possible to obtain descriptions of his behaviour as a child in order to confirm these suspicions as family members were not available for interview. However, assessment with the Connor Adult ADHD Rating Scale (CAARS), using both self and observer reports demonstrated that Participant Eight had a number of difficulties with inattention and memory, hyperactivity, restlessness and emotional control. As his history included poor academic performance, possible diffuse brain injury and chronic pain syndrome, it was not possible to determine the primary cause of these problems.

Participant Nine:

Equestrian activities are associated with a high risk of brain injury (Freeman, Barth, Broshek, & Plehn, 2005). Participant Nine was referred for psychological assistance with severe symptoms of anxiety and depression following a TBI sustained when she fell from a horse three years previously while on a social outing with friends from work. She was 33 years of age at the time of her injury. Following her injury she had difficulty managing at work and in social situations, experiencing irritability, fatigue, and cognitive impairment.

Participant Nine worked in the service industry as a credit controller, a job that she had managed without difficulty prior to her injury. When she returned to work one to two weeks after her injury she found she was not functioning at her previous level of competence, which led to a distressing loss of confidence. She had problems with irritability, fatigue, difficulty in concentration, forgetfulness and a “hazy” feeling of not being there. Her cognitive difficulties included problems with new learning and reduced cognitive flexibility. She found it difficult to manage interpersonal relationships, and worried as to whether she was still able to manage her work responsibilities. She avoided confronting these concerns by making a number of changes in her life, returning to Ireland for a holiday with her family, then moving from

Auckland to Wellington, requiring her to find both a new home and job. These changes added to her overall levels of stress. In addition, during the period of treatment sessions, she spent time on holiday in Australia, which further exacerbated her stress levels. She experienced deterioration in her mood, feeling low, unmotivated and lacking in energy. She also had changes in her appetite and sleep, an inability to concentrate and reduced interest in social activity. Participant Nine had a pre-injury style of struggling to maintain relationships, being sensitive to rejection and being overly dependent on other people, a style which continued after her injury.

*Adaptation of Therapy Programme:* The initial focus of treatment was on providing Participant Nine with educational material about the expected consequences of TBI and on developing compensatory strategies for cognitive difficulties. Strategies that were used to assist with her difficulties in new learning were to reduce distractions when learning new material, to take regular breaks and to revise material at regular intervals.

Completion of the Activity Schedule revealed that Participant Nine's week was essentially focused around her job, with little in the way of enjoyable social activity. In treatment sessions there was discussion of increasing her level of physical activity and making social contacts. She joined Toastmasters and a walking club, reporting that these made a positive impact on her mood during the week. She was able to identify that engaging in pleasurable activities improved her overall level of life satisfaction, her resilience and her ability to cope with stressful situations.

In order to address her levels of depression Participant Nine was encouraged to challenge her negative thoughts and to identify situations in which her thoughts contributed to depressed mood and unproductive interactions with others, in both social and work situations. A Thought Record focusing on an uncomfortable interaction with a work colleague revealed that Participant Nine thought "I'm not trusted" "I'm unable to do my job". Cognitive errors included focusing on the negative and minimising the positive, and mind reading, for example, assuming that her work colleague thought that she was incompetent. Alternative explanations identified that if her work colleague was feeling under pressure this could lead to her being blunt which was interpreted as dislike. Problem solving techniques enabled her to deal proactively with issues as these arose at work. She was encouraged to recognise when she needed to ask for assistance

in her job. Role plays were used in session in order for her to develop confidence in difficult situations and allow her to present herself as competent, confident and professional. Participant Nine's core beliefs were "I'm not good enough" "I'm unlovable". She was able to find evidence that did not support these beliefs, identifying "I do have some very supportive friends and family". A Positive Data Log assisted her in regaining confidence.

*Outcomes:* Participant Nine managed to remain in her job across the time of treatment sessions, in spite of her difficulties, learning to work through interpersonal challenges. Use of Activity Scheduling assisted her in obtaining increased levels of social enjoyment. She learned to challenge cognitive distortions and negative predictions about the reactions of work colleagues. Across treatment sessions there was consistent reduction in symptoms of anxiety and depression as measured by the HADS. At the conclusion of treatment, she was crying with reduced frequency. She was also planning and implementing a number of enjoyable social and individual activities. She reported increased confidence and level of enjoyment in both social and work situations.

*Outcome Measure:* Participant Nine did not complete baseline measures for the HADS as her referral was regarded as urgent and it was not considered to be clinically appropriate for her to wait the three weeks required in order to complete the baseline requirement.

On the HADS Anxiety Scale, Participant 9 initially scored in the *severe* range at referral. These scores rapidly reduced to lie within the *mild* and then the *normal* range. On the HADS Depression Scale, her initial scores were in the *mild* range, then reduced to lie in the *normal* range. See Figure 6.20., p. 129.

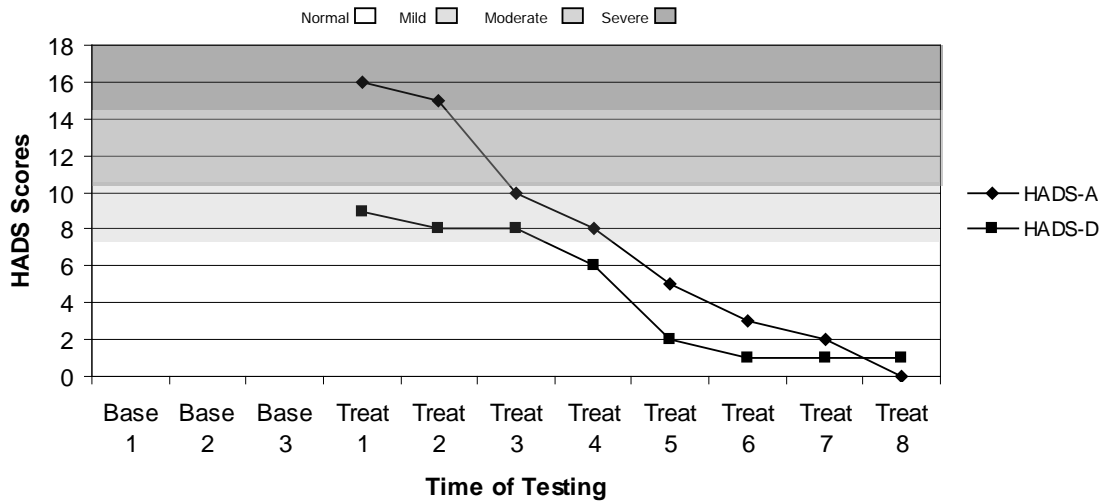


Figure 6.20. HADS scores across baseline and treatment conditions for Participant Nine.

Participant Nine did not have a partner, family member or close friend living in Wellington, who would be able to complete the Informant Version of the PCRS. Her ratings were highest for Activities of Daily Living, followed by Cognitive Skills, Interpersonal Skills then Emotional Skills. See Figure 6.21., p. 129.

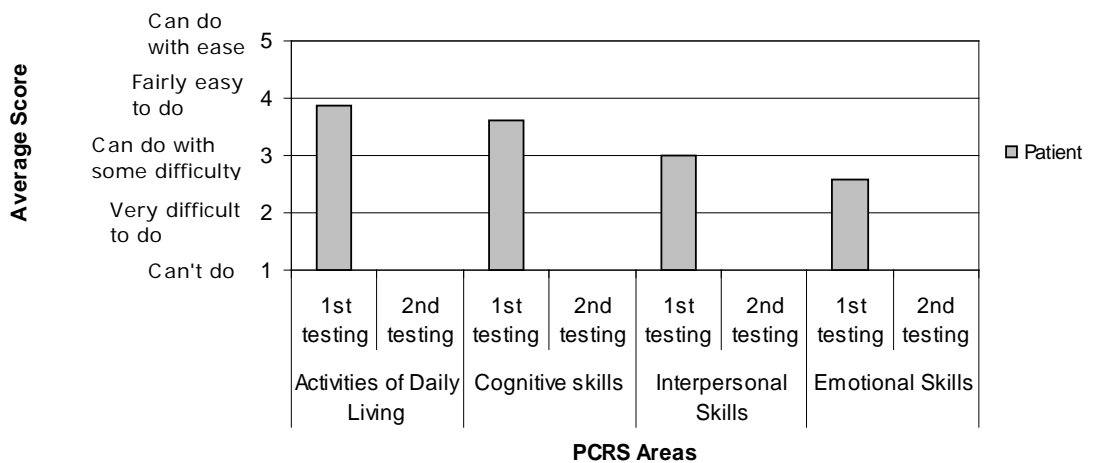


Figure 6.21. Average ratings across PCRS areas for Participant Nine.

### **Compliance and Completion of Homework**

Homework completion can be dependent on a number of factors, including how well the homework task meets treatment goals, whether the client understands the nature of what is required, and whether the client is engaged in the therapy process. For clients with TBI, further compounding factors could include impairments in cognitive processes such as memory and organisational abilities, or physical factors such as pain and fatigue.

The HRS-II was used to assess compliance with homework assignments. It was found that the Therapist Version of the HRS-II was more appropriate for the purposes of this study, in order to minimise the time and effort spent in completing self report forms at the commencement of each session for participants. Therapists were asked to complete the HRS-II for a selection of successfully completed homework assignments. Homework and homework reviews were the tasks that were most frequently absent on the Cognitive Therapy Checklist, indicating that homework completion proved difficult for a number of participants. In all, the HRS-II was completed twice for Participants Four, Six and Seven, and once for Participant Nine.

Inspection of completed Therapist Versions of the HRS-II determined that the questions on the Quantity and Quality of homework assignments received the highest average ratings, while those on the difficulty, pleasure and mastery of assignments received the lowest ratings. Higher ratings indicated a greater degree of mastery by participants. This suggested that when participants completed homework, while they might understand the purpose of the activities, they did not necessarily find them easy to complete. From the Adherence to Cognitive Therapy Manual sheets, Participant Nine had the highest rate of completion of homework tasks with seven tasks (88%) completed. Participants Four and Seven completed four (50%) of homework tasks, while Participants One, Two, Three, Five, and Six completed two (25%) of homework tasks. Participant Eight only completed one (13%) of homework task.

When discussing non-completion of homework with participants, therapists determined that obstacles included the following:

- Difficulty in understanding what the homework task involved.

- Difficulty in understanding the purpose of the homework task.
- Difficulty in remembering to do homework, even if homework tasks were written on homework sheets and stored in the folder or placed in a prominent place in the home.
- Lack of organisational skills with using homework sheets and folders.
- The impact of fatigue in limiting the amount of energy participants had to put into additional tasks in the week.

Some participants reported on the positive aspects of homework tasks. Participant Seven gained satisfaction from completing her artwork that allowed her to express her experience of the impact of TBI. She identified Art projects that she would be able to pursue for relaxation following the completion of therapy sessions. While Participant Six elected not to complete all homework assignments when he was fatigued, he appreciated the gains that he made in understanding the impact on his injury and extended the concept of keeping records by regularly making notes in his diary when attempting to understand what was happening at various confusing points in his day. Participant Nine was meticulous in keeping her homework notes in her folder and made rapid gains over treatment sessions.



## **Chapter 7. Discussion**

The CBT programme provided a structure for treatment sessions and it was intended that this structure be adapted to suit the individual requirements of each participant. Referral issues included adjustment difficulties with a psychological component following TBI. Specific referral problems included depression, anxiety, fatigue, pain, cognitive problems including memory, concentration and organisational abilities, and difficulties with social interactions. Educational material provided participants with information about the physical, cognitive and emotional consequences of TBI. Therapists discussed compensatory strategies to assist with memory, concentration and organisational difficulties. Cognitive therapists assess thoughts, emotions, behaviours, physical sensations and the person's social situation in order to understand the background to a client's situation (Greenberger & Padesky, 1995). CBT strategies in the treatment programme included using the Five Part Model illustrating these interactions, Thought Records or diaries to identify emotional reactions to specific situations and identification of client belief systems and behavioural patterns. This assisted in identification of triggers for low mood, anxiety, fatigue, irritability, and periods of confusion. Problem-solving and decision-making strategies targeted specific conditions or situations such as worry, and the process of planning graded returns to work or training activities.

A number of themes were identified across participants' progress through treatment sessions. These included the need to reassess their expectations in the light of altered abilities following injury, which was made difficult when they compared current to pre-morbid performance and had strong perfectionist tendencies, finding it hard to accept that they might not be able to resume work at the same level as prior to injury. Family members were affected by TBI and often provided a strong source of support for participants, who could worry about the impact of their injury on those closest to them. A number of participants experienced an increase in levels of social anxiety, fearing that they could be evaluated in a negative fashion by others. Motivation varied across participants with some very motivated to achieve as much from treatment as possible, but with others finding it difficult to implement changes. CBT strategies were able to assist participants in addressing these issues, by identifying behavioural patterns and

emotional reactions, challenging negative interpretations of events, utilising problem solving techniques and behavioural experiments in order to test out participant predictions and encouraging more productive behavioural patterns that took into account the limitations imposed by TBI.

It was intended to follow a multiple-baseline design for this research study. Sarafino (2005) described multiple baseline across participant as waiting until the baseline phase for one participant has stabilised before commencing treatment for the second participant. If the only participant whose behaviour changes at any one time is the one newly exposed to treatment, then intervention techniques are perceived to be the cause of change. In the clinical environment of this study, participants were recruited as they presented at the Massey University Psychology Clinic for treatment. Commencement of treatment was driven by clinical rather than research necessity. The design was thus one of a series of single case studies, rather than a true multiple-baseline design.

In single case research studies, it is preferable for baseline conditions to demonstrate a stable pattern prior to commencement of treatment. This was not possible for a number of the participants in this study. The minimum number of measurements for demonstrating a stable baseline is three; however, a stable baseline also requires sufficient observations to be confident that scores are ranging around a specific mean. In a clinical situation where it is necessary to provide timely treatment, this is difficult to achieve. Participant Eight did not complete his baseline measurements due to difficulties with memory and with organisational abilities. Participant Nine presented with an urgent referral, making it inadvisable to delay her treatment for the purposes of collecting baseline data. For all other participants, either two or three baseline measurements were obtained.

There was considerable variation in the responses of participants to treatment, with some making clear gains in reducing symptoms of anxiety and depression, and others making gains in achieving personal goals in returning to meaningful levels of employment or other social activities. For some participants, clear gains were less obvious within the number of sessions approved for treatment. While Participants Three, Six and Seven were approved additional treatment sessions by ACC, these did not form part of this study. Therapists noted that gains towards goal achievement

continued following the treatment sessions. Participant Three made ongoing gains in interpersonal and emotional skills; Participant Six reported confidence in managing work in the following year; and Participant Seven planned for a manageable approach to obtaining part time work. Where anxiety and depression were secondary to other referral issues such as fatigue and pain, if the levels of fatigue and pain remained high, there was limited movement in outcome measures on the HADS Anxiety and Depression Scales.

### **Reduction in Symptoms of Anxiety and Depression**

Of those six participants with HADS A scores outside the normal range at the commencement of treatment sessions three improved with Participant Nine demonstrating a significant reduction in distress levels. Three of the five participants with HADS D scores outside the normal range demonstrated a reduction in symptom levels. However, relatively low baseline scores on these scales combined with small participant numbers limit the power of the current study. It is therefore not possible to conclude that CBT had a significant impact on symptoms of anxiety and depression as measured by the HADS from the results of this study.

*Impact of Other Referral Factors on HADS Scores:* For a number of participants, additional referral factors such as fatigue and pain impacted on the effectiveness of the intervention to address levels of anxiety and depression. When these remained an ongoing issue for a number of participants at the conclusion of treatment sessions symptoms of psychological distress also continued.

Where fatigue was a primary referral issue, if fatigue levels remained high, there was limited change in HADS scores with Anxiety and Depression. This was the case for Participant Seven. In a similar manner, pain formed a major referral issue for Participants Four, Five and Eight, with Participants One, Two, and Seven experiencing intermittent headaches. With Participant Eight there was little reduction in pain levels over treatment sessions, and no reduction of HADS scores, with his HADS Depression score increasing from the *mild* to *moderate* category by the conclusion of treatment sessions. Participant Five continued to find that his pain levels impacted on his ability to maintain his cognitive efficiency, however, his HADS Anxiety scores moved from

the *moderate* to *mild* and his HADS Depression scores moved from the *mild* to *normal* categories over treatment sessions. Participant Four demonstrated fluctuations in the levels of his symptoms with Anxiety scores moving from the *mild* to *normal* categories at baseline to the *normal* category across treatment sessions. His scores on the HADS Depression scale showed a slight movement from the *severe* category at baseline and fluctuating between the *severe* and *moderate* categories over treatment sessions.

### **Progress with Additional Referral Areas**

Fatigue formed an obstacle to returning to previous levels of achievement for participants, with all participants except Participant Three, having fatigue noted as a referral concern. Learning to adopt a paced approach that avoided a “burn and bust” cycle was useful (Participants One, Six and Seven). At the conclusion of treatment sessions, not all participants were able to apply the pacing strategies in a proactive fashion (Participants Five and Eight). Participant Four was able to reduce the level of medication that he needed in order to control his pain, which increased his levels of awareness during the day, however, he continued to sacrifice his sleep time in order to do the activities that he enjoyed such as online activities and watching TV. Participant Two was able to acknowledge that his levels of fatigue and cognitive difficulties had resulted from his TBI, which provided him with validation of his experiences. Participant Nine was able to remain in employment and to work through interpersonal difficulties, which formed part of a pre-injury style, instead of moving from one situation to another, which was her pattern prior to treatment sessions.

Following TBI, fatigue and sleep disturbances can impact on the progress of recovery (Rao, Rollings, & Spiro, 2005) having an adverse effect on cognitive abilities, motivation and psychiatric symptoms. Further research is needed into treatments that target fatigue following TBI. Cognitive behavioural therapy that promotes gradual increases in activity (Malouff, Thorsteinsson, Rooke, Bhullar, & Schutte, 2008) and improves a sense of control over symptoms (Scheeres, Wensing, Knoop, & Bleijenbergh, 2008), has demonstrated efficacy with treating chronic fatigue syndrome. These techniques could be suitable for use with treating fatigue in a TBI population. Treatment of sleep disturbances following TBI can involve a combination of pharmacological and behavioural interventions, for example, focusing on lifestyle

factors such as diet, rest and exercise (Rao et al., 2005). Inclusion of a module that addresses sleep difficulties could be useful in providing psychotherapy for people with TBI. Thaxton and Myers (2002) recommended the inclusion of cognitive treatments that focus on reduction of anxiety around the patient's experience of sleep difficulties as part of a comprehensive approach to improving sleep quality following brain injury. Additional components would include evaluation of sleep problems, use of sleep hygiene strategies, environmental adaptations and pharmacological treatments. Cognitive Behavior Therapy for Insomnia (CBT-I) focusing on cognitive arousal and unhelpful beliefs about sleep (Harvey, Tang, & Browning, 2005) can be adapted to suit specific medical and psychiatric conditions (Smith, Huang, & Manber, 2005). Research into the effectiveness of CBT-I for those with TBI would be useful.

Chronic pain which can adversely impact on cognitive function can be associated with TBI (Zasler, Martelli, & Nicholson, 2005). Headaches are a common consequence of post concussion syndrome, and formed a component of the referral factors for participants in this study (Participants One, Two and Seven). Additional pain problems were experienced as a result of the accident that led to the TBI (Participants Four, Five and Eight). In this study, pacing techniques developed for use with pain conditions (Cole et al., 2005) that encouraged proactive scheduling of rests, relaxation and breaks, and the establishment of sustainable levels of activity prior to attempting to increase workloads, were useful in helping participants to avoid setbacks due to excessive pain and fatigue. Branca (2006) has noted that CBT treatments, graded exercise and pharmacological treatments can be useful in managing pain following TBI. Tyrer and Lievesley (2003) have recommended including CBT to address behaviours that do not promote long term benefit as part of a comprehensive approach to pain management for people with TBI. However, these authors noted that while psychological strategies are of value, improvement in managing the impact of pain can be slow. Research is needed to determine the effectiveness of pain management strategies for people who have also sustained a TBI.

A number of participants learned compensatory strategies to assist with or minimise cognitive impairment. Participant Four was able to adapt his mobile phone for use as a diary and prompt. The use of external aids can reduce the load on memory or executive functions in order for the person to successfully complete a task (Sohlberg & Mateer,

2001). Working at times which allowed for optimal levels of concentration proved useful (Participants Six and Seven). Using enriched processing was a strategy that Participant Seven was able to adopt to assist with learning and memory. The strategy of working harder and longer in an attempt to attain pre-injury levels of performance proved counterproductive in that it adversely affected cognitive efficiency (Participants One and Five). For these participants, treatment focused on developing and maintaining sustainable levels of activity.

Maintaining or improving interpersonal relationships with family and work colleagues formed a treatment goal for a number of participants. Gains were made in interpersonal relationships by Participants Three and Nine. Participant Three began to recognise his emotional reactions and to gain some insight into his interpersonal sensitivities. Learning to work through interpersonal difficulties in her workplace was of benefit for Participant Nine. This is discussed further in the section of Individual Achievement of Personal Goals, pp. 145-147.

Returning to work or social activity formed a goal for all participants. Levack, McPherson and McNaughton (2004) have suggested that while people with TBI value returning to full time paid employment, their perceptions of success are also influenced by the impact of work on non-working lives, sustainability of employment, meaningful productivity, and personal values. A number of participants in this study were concerned about the impact of returning to work or training activities on their family relationships and life outside of work (Participants One, Four, Five, Six, Seven, Eight and Nine). While Participants One, Two, Five and Seven were encouraged to plan their return to work in a graded fashion, there were concerns that Participant Five continued to work longer hours than he could sustain in a regular manner at the conclusion of treatment sessions. Participant Four successfully managed his return to work; however, he reported a lack of satisfaction in this position, preferring to focus on activities such as online games that he could pursue at home. Participant Six achieved his vocational goals by working in a part time capacity through 2007, gradually building up to 40 hours a week by the conclusion of 2007. He expressed confidence that he would be able to maintain a combined teaching and management role in 2008. Participant Nine managed to achieve a reduction in her levels of anxiety and remained in her work position across treatment sessions. Participant Three made progress in successfully

completing a work trial. This had not resulted in a work position at the conclusion of treatment sessions. He did, however, make gains in his level of insight into his interpersonal relationships. Participant Eight wished to return to employment. His ongoing levels of pain made it difficult for him to achieve this goal over the time of treatment sessions.

### **Usefulness of CBT Approach for People with TBI**

There were common themes identified in the progress of participants in adjusting to the impact of TBI. Changes in physical, cognitive and emotional abilities required adjustment in expectations. These changes impacted on families and social situations. Participants could experience changes in their levels of motivation and tendency to worry about their situation and the long term impact of the injury. The changes observed across time in participant's progress will be highlighted in order to discuss the suitability of CBT in assisting with adjustment following TBI. CBT targets cognitive patterns that affect behaviours and emotions. There will be discussion of the behaviours and emotions that would be expected to change with a CBT intervention targeting those with TBI and of those that would be less amenable to the CBT approach.

### **Adjusting to Changes in Abilities and Expectations Following Injury**

People who have sustained a TBI can find that there are obstacles that impede their ability to return to former occupations and activities. Participants in this study found that obstacles included fatigue, pain, cognitive impairment with memory, attention, and organisational and planning abilities, changes in self concept, and loss of social confidence. The educational material provided at the commencement of treatment sessions provided validation of experience for participants, in explaining that a number of difficulties, for example fatigue, cognitive difficulties and emotional changes, could be direct and indirect consequences of the injury. Activity Schedules were useful in identifying work patterns and times of the day in which work productivity was optimal and times when fatigue made work less effective. These were also useful in determining levels of social involvement for participants and programming additional social, recreational and other productive enjoyable activities that could assist with improvement in mood. Thought Records allowed participants to identify when they

were experiencing strong emotional responses, related in some cases to harsh personal judgments about changed work abilities (Participants One, Two, Five, Six and Nine). Comparisons with pre-morbid levels of function could lead to mood fluctuations and unrealistic expectations given the limitations that had been imposed by TBI and the often slow progress of recovery. Thought Records assisted with identification of cognitive errors, such as “should” and “must” statements and minimising achievements and maximising errors. Extended Thought Records provided participants with the opportunity to examine evidence and challenge Negative Automatic Thoughts around their abilities and the responses of others to their efforts.

Problem solving techniques and behavioural experiments were useful in generating solutions to social or work difficulties. There was a tendency among participants with a strong work ethic to work longer and harder in order to make up for perceived lowered levels of performance. This technique proved counterproductive as it led to increased levels of fatigue which in turn led to lowered levels of cognitive efficiency, creating a maladaptive cycle. Participant Five for example, continued to redo jobs until he was satisfied, with a negative impact on fatigue levels. Problem solving and decision making techniques assisted him in identifying the need to develop sustainable work patterns, however, at the conclusion of treatment there was doubt that he would be able to accept that he was no longer able to sustain previous work patterns. Other participants also demonstrated high levels of frustration with changed abilities. Problem solving assisted Participant Nine in recognising that she could deal proactively with work issues by, consulting with colleagues using checklists and preventing herself from moving on when difficulties arose. Participants Six and Seven were able to use these techniques to identify optimal times for productive work and methods of managing tasks once noticing the onset of fatigue.

### **Adjustment to Changes within the Family and Social Situations**

A number of participants worried about the impact of their injury on their families. Participants Two and Four returned to live with family after previously being independent, a change that could lead to increases in tension in the home. Participants Three and Seven remained at home, receiving continued support from family. Thought Records were useful in identifying emotional reactions and associated negative



automatic thoughts around friction in family situations. These were able to be challenged providing balanced and more realistic assessments of family situations. Participant Four for example was able to identify that his father had a number of additional factors, for example, work stresses, that could impact on his mood and irritability within the home. Participants One, Five, Six and Eight were concerned about their responsibilities as income earners within the family and about the impact of their injury on family dynamics. Thought Records assisted with identification of concerns around personal responsibility for family and in challenging whether family members were able to assume this for themselves. Participant One was able to challenge his level of responsibility for the decisions of one of his daughters. Participants Five and Six were able to identify that stress had a negative impact on the quality of relationships within the home. This allowed them to challenge the way in which they interacted with their partners and children, seeking alternative ways to spend family time. Participant Eight found difficulty in using Thought Records and making changes to his confrontational interpersonal style within the timeframe of treatment sessions.

A number of participants experienced an increase in social anxiety levels following injury. Participant Two worried about that others would judge him for being out of employment. Along with Participant Nine he worried that others would be critical of the amount of time it was taking to recover from the injury. Participant Three experienced ongoing difficulties in social situations, being sensitive to perceived criticism. Participant Four had felt different prior to his injury as he had ongoing difficulties with stutter. The injury aggravated these feeling of difference as his reduced physical abilities led to weight gain and prevented him from returning to riding his motorbike. Participant Seven experienced a lack of understanding from her peer group around her experience of fatigue. Fatigue and pain impacted on the quality of social interactions for Participants Five, Six and Eight and could lead to abrasiveness in their style of communication. CBT techniques that were of use included Thought Records that allowed for identification of emotional discomfort in social situations and allowed for challenging of participants perceptions. Problem solving techniques were useful in identifying different approaches to social situations. Participants Three and Nine were encouraged to use assertive rather than aggressive responses when in confrontational situations and were able to practice these in sessions. Participant Seven was able to role play an assertive approach to explaining the impact of fatigue in session.

### **Changes in Tendency to Worry and in Levels of Motivation**

Changes in abilities increased the tendency of a number of participants to worry about their situation. Worries focused on the impact of the injury on families, the ability to complete tasks to a satisfactory standard, and employment opportunities. Thought Records were useful in identification of emotional responses to situations that gave rise to worry and allowed for the opportunity to challenge negative thinking styles and cognitive distortions, for example, personalising responsibility, mind reading, and viewing situations in black and white terms. Participant Seven had a positive belief about the purpose of worry, identifying the belief “If I don’t worry I will not be organised”. A strongly held belief was “I will not be employable in the future”. Problem solving techniques assisted her to identify that she could manage work if she restricted her hours and was able to work in the mornings when her fatigue was less pronounced.

A number of participants were strongly motivated to return to work. For these participants, treatment focused on identifying sustainable work patterns in order to best facilitate this process. For Participant Four, regaining motivation formed a major hurdle. He found it difficult to make changes in his work situation and sleep habits. Restricted sleep patterns further increased his daytime tiredness, lowering motivation to engage in physical and social activity. The limited number of treatment sessions did not allow for time to address these issues. A longer term Motivational Interviewing approach (Miller & Rollnick, 2002) could be useful in overcoming the ambivalence associated with change, but was outside the scope of this project. Participant Nine experienced loss of motivation when difficulties arose in the workplace. Problem solving strategies encouraged her to address these situations, resolving conflict as it arose.

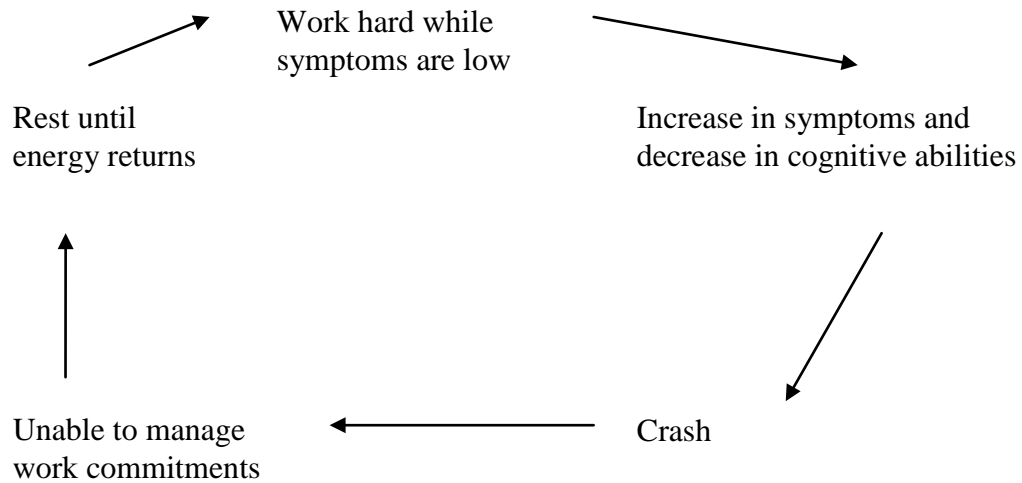
### **Changes Observed Across Treatment**

Adjusting to changes following TBI required development of insight into the nature of individual levels of cognitive and physical consequences. The development of insight into the changes required in order to adjust to life post-TBI varied across participants.

For a number of participants returning to work, training or social activities implied doing this in a graded fashion. This involved learning to proactively manage symptoms such as fatigue and pain, improving individual abilities to manage social interactions within the family and at work, developing compensatory strategies for cognitive impairments, and building up work and training activities as the ability to manage these slowly improved. There were a number of components of the CBT programme that were useful in this regard. Educational material provided validation of personal experience. Activity scheduling helped to highlight times at which fatigue, pain and cognitive difficulties became pronounced. Participants were able to identify early warning signs of fatigue or potential crashes and to problem solve around these situations. Learning compensatory techniques for difficulties with memory, attention and organisational abilities were useful in the workplace and at home. Thought records assisted with the identification of negative thought patterns and cognitive distortions which could then be challenged in order to provide more realistic and constructive approaches to individual situations. Behavioural experiments allowed participants to test out potential work patterns or anticipated reactions from family members or work colleagues. Identification and understanding of personal belief systems, for example around the need to be employable and achieve at a high level at work, was useful in helping with acknowledgement of the impact of changes in abilities.

### **Changes in Behaviours and Emotions with CBT Intervention following TBI**

The behaviours that were challenged with the CBT intervention were those that involved attempting to resume activities at the same level and pace as prior to the injury. For a number of participants the well intentioned attempts to work harder and longer in order to meet work requirements was counter-productive in that this increased symptoms such as pain and fatigue which in turn reduced cognitive efficiency and further aggravated these symptoms. Developing a realistic approach remained a challenge to be met by participants. The approach that was useful for a number of participants was to pace activities and proactively schedule rest periods in order to allow for times when fatigue and pain would be expected to be high. This assisted with avoiding a “burn and bust” cycle. This approach is used as a model for managing chronic pain (Cole et al., 2005).



*Figure 7.1: Burn and Bust Cycle for Fatigue following TBI*

The aim of a paced approach to managing fatigue or pain is to develop a sustainable level of activity as opposed to working at a full pace while feeling well, then needing to crash for a few days in order to recover, then working hard again. Once a sustainable level of activity is developed then this can then be increased in a gradual fashion. Clients can be encouraged to do less than they think that they can in order to maintain this sustainable level of activity. This model can be difficult for clients to adhere to, particularly when they wish to maintain a strong work ethic. The model shown in Figure 7.1, p. 143, is counter to this ethic.

### **Levels of Insight and Awareness**

The small number of participants and difficulties in obtaining complete sets of Patient and Informant ratings on the PCRS skill areas at both times of rating impacted on the ability to detect significant differences between Patient and Informant ratings or to determine whether participants demonstrated increased awareness of strengths and weaknesses over the course of treatment sessions.

Activities of Daily Living were the areas rated on the PCRS as causing the least difficulty among participants, confirming findings of Leathem and colleagues (1998). Participants and informants demonstrated the largest differences in agreement of abilities on Interpersonal Skills, indicating that while participants were aware of their difficulties in these areas, the difficulties might not be so evident to family members.

### **Homework Assessment**

Of the therapy tasks outlined in the CBT Manual, homework and homework reviews were the tasks most frequently missing on the Cognitive Therapy Checklist. Participants found some difficulty in completing homework tasks on a regular basis. Cognitive abilities and fatigue levels impacted on the ability to manage homework with difficulties in memory, planning and organisational abilities impeding homework completion. Therapist HRS-II ratings indicated that while participants might understand the purpose of homework, they did not necessarily find it easy to complete. However, the practice provided by homework tasks did provide some participants with ideas that could be of assistance in the future, for example, using diaries to identify themes and clarify daily experience (Participant Six). In this way, homework activities promoted the generalisation of skills to the home and work environment outside of treatment sessions.

### **Adherence to the Cognitive Therapy Manual**

The scheduled tasks of the Cognitive Therapy Treatment were more closely followed in the early stages of therapy sessions. All participants were able to complete the Activity Schedule, a behavioural task that allowed for identification of how the participant allocated time during his or her week. Educational material proved useful for participants in validating their experiences of physical and cognitive consequences of TBI. The general Cognitive Model, which provides an explanation as to how thoughts, emotions, behaviours, physical reactions and the social environment interact was discussed with all participants, along with specific adaptations of this model to fit the individual participant. The Cognitive Model was adapted to explain how excessively high expectations of performance could lead to a tendency to work harder or longer, which in turn led to increased levels of fatigue or pain, or to lowered mood (Participants

One, Five, Six, Seven, Eight and Nine). Thought Records or Diaries were used to assist in recognising the connections between their thoughts, emotional reactions and behaviours, with these completed by all participants except for Participant Eight. Problem solving techniques proved useful for a number of participants, and were adapted to specific participant issues (Participants Four, Five, Six, Seven and Nine). Using different means of expressing reactions to injury was reported to be beneficial (Participants Seven and Nine). Tasks were not used if they were inappropriate to the individual. Complex problem solving tasks were not used for those with more limited organisational skills (Participants Three and Eight).

### **Individual Achievement of Personal Goals**

Factors that impacted on achievement of goals included the level of personal expectation, ongoing levels of fatigue and pain, interpersonal skills, organisational abilities, and the level of awareness and insight into emotional reactions. For some participants, maladaptive behavioural patterns, particularly with regard to high levels of personal expectation, and difficulties in interpersonal interactions hindered progress towards achievement of personal goals.

High levels of personal expectations could have long term advantages in providing the motivation to return to productive activity and learn compensatory strategies for physical or cognitive impairment. However, in the earlier stages of rehabilitation following TBI, these high expectations could potentially be counter-productive if they promoted over-estimation of abilities and resources. Participants found that post TBI reduction in cognitive efficiency and high fatigue levels impacted on their ability to sustain prior levels of achievement. A common pattern was that of making pre-injury comparisons and trying hard to keep up with former work patterns, experiencing disabling levels of fatigue, and then being unable to function effectively for a period of time (Participants One, Two, Five, Six, and Seven). The approach of working harder and longer proved counterproductive as it could further aggravate levels of fatigue or pain and impact on cognitive abilities. Learning to pace activities and develop sustainable patterns of activity was useful for some participants. The CBT model for working with chronic pain (Cole et al., 2005) could be adapted in order to assist those

with TBI in adapting to high ongoing levels of fatigue. Further research could be useful in this area.

A number of features of the CBT programme assisted in promoting sustainable patterns post injury. Educational material provided validation of participants' experiences following injury with information on common physical, cognitive and emotional consequences of TBI. The use of Activity Schedules allowed participants to highlight times when fatigue, pain and lowered levels of cognitive efficiency became an issue. Thought Records assisted in the identification of thoughts and beliefs that prevented implementation of a realistic work schedule. Problem solving techniques were useful in assisting with management of specific participant issues. Participants were encouraged to establish sustainable patterns of activity and to build on these as they worked towards re-integrating into employment, training or family responsibilities.

Interpersonal relationships can be adversely affected by the consequences of TBI (Crisp, 1994; Thomsen, 1984), with families often bearing the brunt of cognitive and physical changes (Kreutzer et al., 2002; Lezak, 1986). For some participants the brief time frame of approved treatment sessions did not allow for effective addressing of interpersonal difficulties (Participants Three and Eight). Family relationships were often experienced as being more strained than prior to the injury (One, Four, Five and Six). These participants were encouraged to spend time pursuing enjoyable activities with those close to them, their partners, parents and/or children. Maintenance of working relationships could be challenging. Learning to develop effective communication skills with work colleagues, friends or others involved in training activities was helpful (Participants Four, Seven and Nine). For a number of participants, families remained a source of support and encouragement in spite of the difficulties arising from TBI (Participants Two, Three, Four, Five, Six and Seven).

Participants' organisational abilities were illustrated in their management of the folders provided for their use over therapy. Clear-file folders were provided for storing handouts and homework material. While a number of participants (Participants One, Four, Five, Six, Seven, Nine) managed their folders well, using them to store materials and having them available for therapy sessions, others either found these difficult to use or forgot to bring them to sessions (Participants Two, Three, and Eight). As well as

reflecting participants' planning and organisational abilities, consistent management of folders could also have reflected a degree of motivation and engagement in the process of therapy.

Two participants (Two and Three) overestimated their levels of ability on three areas of the PCRS as compared with Informant ratings. These participants did not demonstrate clear gains from therapy as measured by the HADS (Zigmond & Snaith, 1983). While Participant Two's referral was to assist with symptoms of low mood and management of post concussion symptoms, he was not depressed as indicated by the HADS at the commencement of treatment sessions. Overestimations on the PCRS occurred in the areas of Activities of Daily Living, Cognitive and Interpersonal areas. He was able to benefit from learning that his symptoms were directly related to his injury, and needed to be taken into account as he prepared for future work. Participant Three was not depressed at the commencement of treatment sessions. He overestimated his abilities on Cognitive, Interpersonal and Emotional skills. A major focus of his referral was to assist with his interpersonal relationships. At the second time of rating, his estimation of his Interpersonal Skills more closely matched that of his mother.

## **Limitations of the Study:**

### **Small N Design**

In looking at the individual achievement of personal goals, brief case studies were provided for each participant. As noted at the commencement of this chapter, the multiple-baseline design which introduced treatment with successive participants once baseline conditions had stabilised with the prior participant, was unrealistic with regards to participant well-being in the clinical setting. The study thus presented single case designs for each participant. Single case studies can rely heavily on clinical judgment and interpretation (Kazdin, 2003) and may contain a subjective element as therapists attempt to form a picture as to what has happened for each participant. Participants' past experiences, personal expectations and levels of motivation were variables that could have impacted on outcome. The participants in this study presented with a range of backgrounds and social concerns, with co-morbid conditions that potentially



contributed to their difficulties. With Participant Eight, for example, contributing factors included TBI, pain and inattention difficulties that could have been attributable to ADHD. Case studies are vulnerable to threats to internal validity, as there may be alternative explanations that account for participants' reactions across the time course of treatment sessions. The availability of social support varied between participants and across the course of treatment sessions with changes in family dynamics in making adjustments to TBI. Families were able to provide support for a number of participants (Participants One, Two, Three, Four, Five, Six and Seven) while others (Participants Eight and Nine) had more limited family resources to draw on. There can be limited external validity as it may be difficult to generalise from specific case studies to the situations of other individuals (Sarafino, 2005), in this instance to other people who have sustained a TBI. This study did not address adapting treatment to those with severe communication difficulties or problems with behavioural dyscontrol. The small number of participants limited the power of the statistical analysis of group data and the ability to determine effects that were present. It is difficult to determine interaction effects between variables with few participants (Sarafino, 2005). Small numbers and difficulty in obtaining completed PCRS data meant that it was not possible to detect effects between Patient and Informant ratings on PCRS. It was also not possible to determine the effectiveness of the CBT approach in addressing symptoms of depression and anxiety as measured by the HADS.

### **Selecting Appropriate Measures**

Participants in this study presented with a range of conditions, including anxiety, depression, fatigue, pain and cognitive impairments. The HADS Anxiety and Depression Scales were able to provide an indication of progress made by participants in reduction of symptoms of anxiety and depression. However, for some participants, other variables such as pain, fatigue or worry may have been a major co-morbid condition. Measurement of these conditions was not addressed by the measures selected for this study. While it was possible for therapists to use other individual measures as appropriate, these contributed to monitoring individual progress, but did not make a contribution to overall group results for the study.

For a number of participants, the focus of treatment was on adjustment to TBI and managing a return to work or social activities. The difficulties experienced by these participants were in a number of instances not best reflected by HADS Anxiety or Depression scores (Participants Two, Three, Six and Seven). In order to best describe progress for individual participants, measures would need to be tailored specifically to individual presentations, making it difficult to obtain group comparisons.

Fatigue was a major factor that impacted on the progress of participants in this study. People with brain injury have been found to score higher on fatigue measures than people without brain injury (LaChapelle & Finlayson, 1998). Brief measures such as the 10-item Fatigue Assessment Scale (FAS) (Michielsen, De Vries, Van Heck, Van de Vijver, & Sijtsma, 2004) and the reduced 15-item Fatigue Impact Scale which has been validated on patients with chronic pulmonary disease (Theander, Cliffordson, Torstensson, Jakobsson, & Unosson, 2007) could be suitable for use people with TBI.

Achievement of personal goals can depend on being able to return to meaningful activity. Subjective factors (Levack et al., 2004) are of importance in this area. Assessment of outcome can be discussed with participants in accordance with how successfully individual goals have been met.

## **Conclusions**

The CBT approach to psychotherapy can be useful in assisting readjustment for people who have sustained a TBI. However, levels of organisational skills and cognitive impairment impact on the ability to benefit from this approach, with intact organisational skills assisting in the understanding and completion of treatment tasks. The educational component of the CBT programme such as learning about the expected consequences of TBI was reported to be beneficial by a number of participants as it provided validation of their experiences and assisted with the development of insight into difficulties that had arisen since injury. Keeping records, for example, with Activity Schedules, diaries and Thought Records, assisted participants to develop awareness of the triggers and patterns that could exacerbate fatigue, pain, and cognitive difficulties, and thus lead to mood fluctuations and increased anxiety. This allowed participants to experiment with changes such as scheduling rest periods, finding the

optimum times at which to work, implementing compensatory techniques for cognitive impairment, and keeping work commitments to a manageable level. Pacing techniques whereby participants determined sustainable levels of work and activity and were encouraged to take breaks prior to becoming unproductive were useful in the management of fatigue and pain. Problem solving techniques proved useful in assisting participants with exploring causes of frustration in work situations, determining how best to manage responsibilities, assisting with resolving specific worries, and identifying productive approaches to managing interpersonal difficulties. The components of the CBT programme were able to be adjusted to meet the individual referral requirements of participants.

The amount of family support varied for participants. Parents and extended family provided a home and ongoing practical support for a number of participants despite increased tensions that could arise from the impact of TBI on a family member. For those participants who were themselves parents, while TBI led to increased tension within the family, partners and children were able to provide a sense of stability as participants attempted to return to productive work patterns. For those with limited family support, interpersonal challenges were addressed within the work place.

Motivation was a participant attribute that was not measured as a part of this study. However, where participants were able to identify clear goals for therapy, this assisted with the direction and progress of treatment sessions. Addressing motivational issues around change for participants was outside of the scope of this study.

There were some areas of concern for participants that did not respond to the CBT approach in the limited number of approved sessions available for the purposes of this study. Additional ACC approved sessions were of benefit in achieving personal goals for some participants. Increasing levels of motivation for change for some participants, or addressing long standing personality issues were outside the scope of this study.

There is a part for a CBT approach to adjusting to changes following TBI, particularly in assisting in reassessing expectations following injury. Initial attempts to return to pre-injury work patterns and workloads can exacerbate cognitive difficulties which can in turn increase physical symptoms such as fatigue and pain. This can result in the

person working hard when feeling well then needing to rest for prolonged periods in order to rebuild their resources. Learning to develop realistic sustainable levels of activity can be useful. CBT techniques assist with clarification of what the individual is able to sustain with regard to work and social commitments. This can provide a base from which to work for the future, whether this is in returning to work, training activities or to social interaction. CBT can also assist in promoting the achievement of individual goals, a process that can be enhanced by the definition of clear goals at the commencement of treatment sessions. Factors that appear to enhance the ability to benefit from the CBT programme appear to be retaining organisational and cognitive abilities, and having good family and social support. Further research with larger numbers of participants could assist in identifying the impact of these factors.

## **Appendix 1**

### **COGNITIVE THERAPY FOR CLIENTS WITH TRAUMATIC BRAIN INJURY**

#### Introduction to CBT for TBI manual

#### ***Theoretical basis for this Manual***

Cognitive-based psychotherapies have been shown to be effective treatments for depression (Persons et al., 2001) and anxiety (Wells, 1997). Beck (1995) outlines a basic structure for cognitive therapy sessions and programmes. This manual has been constructed based on the writings of these authors and others who have contributed to knowledge in the fields of cognitive psychotherapy and psychotherapy following Traumatic Brain Injury (TBI). References are provided at the end of this document.

#### ***Adapting the programme to the individual***

The Cognitive Therapy for TBI manual provides guidelines for therapy. This should not prevent the therapy from being adapted to suit the individual needs of the client. Some sessions, for example, may need to be extended to cover two or more therapy hours, depending on client issues such as fatigue, memory, attention span, and comprehension of material. It may also be appropriate to have more frequent, shorter sessions for those clients who are unable to maintain attention over a full hour-long session. Therapists can use the overall plan, while making adjustments according to the capabilities/needs of the individual client. Khan-Bourne and Brown (2003) suggest a number of techniques that can aid the delivery of CBT for those with cognitive difficulties. These include the use of memory aids such as written notes, cue cards or audio tapes; adjusting the length of individual sessions; increasing the frequency of sessions; involving family members to reinforce therapy techniques; and using techniques such as summarising in order to refocus tangential individuals.

The Massey University Psychology Clinics provide a comprehensive psychological and neuropsychological assessment service. Clients who are referred for this treatment will have received such an assessment, which will highlight any organic-based conditions that need to be considered in adapting the therapy to the client. Potential difficulties with attention, memory, communication, visual-spatial impairment, and abstract reasoning ability will have been outlined in the referral information. The assessment will also highlight any psychological or adjustment difficulties experienced by the client. Clients will have received an introduction to the services provided by these Clinics, which will cover issues such as confidentiality and safety. However, the therapy programme provides for an initial assessment session in which this information can be confirmed. The client can present their own description of the impact of TBI on their day-to-day activities, and can describe their coping strategies. Information about issues of confidentiality and safety can be repeated and the timetable and structure for therapy will be outlined at this session. Clients will also receive a clear file folder, which they can use to file information about therapy, handouts, homework and any other relevant material.

### ***Clients for CBT programme***

The therapy programme is aimed at TBI clients who have adjustment needs following their injury. These clients would need to be able to take part in predominantly verbal interactions, although the programme makes some allowance for using alternative methods of expression for those who can interact verbally, but find that other modes of expression can better illustrate their current position (for example, art or music). While it may appear that the programme is aimed for those with mild TBI, there may be a number of clients with moderate or severe TBI who would benefit from the therapy programme. The therapy is not adapted for those in the acute stages of recovery, or who exhibit severe behavioural dyscontrol. Karol (2003) suggests that these TBI clients may be better served by a neuropsychosocial approach that aims to adapt the environment to the client as opposed to adapting the client to the environment. The therapy is similarly not aimed at those TBI clients who have co-morbid issues such as alcohol and drug problems, personality disorders, or psychotic conditions. Looking at issues of co-morbidity would be a topic for further research.

Ponsford (1995) suggests that, while many individuals who have sustained TBI have difficulty in benefiting from traditional psychotherapy, cognitive-behavioural techniques lend themselves to dealing with a number of the difficulties that are presented in therapy. She suggests that therapy can be adapted to accommodate various cognitive limitations.

### ***Including families in the programme***

Achieving the goals of therapy involves working collaboratively with the client and accommodating cognitive impairments and environmental variables relevant to each individual. Rehabilitation success further depends on a true collaboration with the client and family members or other support persons in the client's life (Sohlberg & Mateer, 2001). These authors outline three different phases of involvement for families with rehabilitation activities, which could be adapted to the psychotherapy programme, 1) interviewing; 2) identifying and prioritising goals; and 3) monitoring change and revisiting goals. Depending on the consent of the client, families can be involved with providing initial assessment information during the assessment session. Family members may be able to provide additional perspectives around day-to-day difficulties experienced by the client. Session 1 includes provision of information about TBI and consequences. Families also benefit from access to this information, and may be included in this session, or may be given the opportunity to read information at home. As agreed with the client, families may also assist with identifying and working towards the goals of therapy. They may help with gathering information during the Applied Behavioural Analysis, outlined in Session 2. In this way, there is scope for including families in the early stages of therapy. This can be discussed with the client from the outset of therapy. As therapy progresses, families can also assist with identifying problematic situations, encouraging the client with non-verbal modes of expression as appropriate, problem solving, and in developing concrete support plans for any difficulties that may arise after conclusion of therapy. As appropriate, families can assist with reporting on client progress and providing feedback for the therapist.

### ***Follow-up sessions***

The therapy programme will include two follow-up sessions, at 3 months and 6 months after termination of therapy. The client will also be able to contact the service as required. The aim is to encourage independence in the client, while maintaining a

connection. If families have been included over the course of therapy, they can help with reinforcing support plans and reporting on progress.

## **Preliminary Session: Assessment**

### ***Goals***

Establish relationship.

Obtain client history.

Obtain the client's description of his or her current difficulties and coping strategies

Obtain additional information about the client's mood state, symptoms and current functional level. Assess for areas of risk.

Normalise client's difficulties, instil a sense of hope.

### ***Structure of the session***

Obtain the client's history and description of current problems.

Administer objective measures of mood, symptoms and functional level. Assess for areas of risk.

Allow time for questions

Provide summary

### **Interventions**

#### ***Relationship Building***

It is important to start building a relationship with the client from the initial contact. The therapist can introduce himself/herself, provide information about the service, discuss therapy as a collaborative exercise, and explain the need for record keeping. During the course of the assessment session the therapist will get to know the client by eliciting information about his or her family and work background, and by listening empathically to the client's description of the accident and how it has impacted on functional abilities and close relationships. Establishing a relationship with a TBI client may require additional effort on the part of the therapist. It may be necessary to check out that the client has heard and understood discussions at regular intervals during sessions. It is also important that the therapist monitors the client's ability to maintain attention. Adjusting the length and timing of sessions may be appropriate for clients who have difficulties with fatigue and concentration. The client will be provided with a clear-file folder that can be used to keep information, handouts and homework. This folder will contain an outline of therapy sessions and an explanation of the therapy process.

The therapist can also discuss issues of confidentiality with the client. Any information that is obtained during therapy sessions remains confidential unless there are issues indicative of harm to the client or to other people. This matter will be revisited later in the session when the therapist obtains measures of mood and other symptoms, and assesses areas of risk.

#### ***Obtain Client History.***

The therapist can work with the client to build up a picture of his or her developmental progress, family background, and educational and work history. It is useful to include a genogram and notes of any history of physical illness or mental health issues that have affected family members. The therapist can explore relationships within the family with the client. The client may not remember the various milestones that were achieved



during childhood. Where appropriate, other family members may be able to assist with these. The client can outline his or her educational progress and work achievements, describing any involvement in social, cultural, sporting, and academic areas. The therapist can explore any areas that were particularly concerning or rewarding for the client. This history can assist the therapist and client in working collaboratively to develop an initial conceptualisation for the client. Therapist and client will continue to refine this conceptualisation over the course of therapy.

#### *Client's Description of Current Difficulties and Coping Strategies*

Listening to the client's description of current difficulties will assist the therapist with both establishing the therapeutic relationship and in forming the initial conceptualisation. The therapist can obtain a brief history of the client's accident and the difficulties that he or she has encountered since that time. The client will have completed a neuropsychological assessment, but it is helpful to obtain an update on any matters that have arisen since the assessment and to allow the client to describe any subsequent difficulties in his or her own words. The therapist can also ask what strategies the client uses in order to manage these difficulties, and whether these strategies are effective. For example, the client may have a sleep in the afternoon or may limit the amount of contact he or she has with other people, in order to minimise the effects of fatigue or problems with concentration. This can also provide the therapist with an initial opportunity to inquire about difficulties with decision making and problem solving.

#### *Obtaining Additional Information*

The progress of the client over the course of therapy, will be measured by the Hospital Anxiety and Depression Scale (HADS) and the Patient Competency Rating Scale (PCRS). These measures will be administered before therapy commences, at the beginning, middle and end of therapy, and at follow-up. It may be possible to ask the client to come about 5-10 minutes early for these sessions so that these measures can be completed. The client will also have an opportunity to report briefly on progress and current issues at the start of each therapy session.

The therapist will also need to assess for any areas of risk. This can include looking at possibility of self harm or harm to others, as well as an alcohol and drug screen. Discussion of issues of confidentiality will have occurred at the start of the session. Referral information will give an indication of the possibility of co-morbid psychological issues.

#### *Normalising Client's Difficulties, Instilling a Sense of Hope*

Those who survive a TBI are often very distressed by the changes that have occurred following the injury and may fear that they are going 'crazy' when they have problems in initiating and completing daily activities, and with controlling frustration levels and emotional arousal. Learning about the consequences of brain injury may allow the client to accept their symptoms as being common to others in the same situation. The therapist can relate specific symptoms to the client's individual injury. Some issues will resolve over time, while others will be more persistent and may require the client to engage in rehabilitation or learn to use compensatory strategies. The therapist can discuss current rehabilitation options for the client and reinforce any compensatory strategies that may have been recommended by rehabilitation professionals.

A number of compensation strategies can be used with the therapist during the course of therapy. These may include both the client and therapist making notes or tapes during each therapy session; limiting the length of sessions in order to maximise the client's attentional capacity; and scheduling frequent sessions at times when the client is fresh. Towards the end of the assessment session, the therapist can encourage the client to ask questions, think about any goals for therapy during the coming week, provide a handout about the routines involved in Cognitive Therapy, and can give a written summary of the session. A more comprehensive discussion of the common sequelae of brain injury will occur in the next session.

## **Session 1: Introduction into treatment.**

### ***Goals***

Introduce agenda setting for therapy sessions.

Discuss client's injury and provide information about TBI and possible consequences.

Discuss client's expectations and negotiate goals for therapy.

Introduce the Activity Schedule.

### ***Structure of the session***

Set the agenda for the session.

Educate the client about TBI and common consequences.

Identify problems and set some goals for therapy. Raise issue of eventual termination of therapy.

Set homework (Activity Schedule, goals for therapy).

Provide client with a summary of the session.

### **Interventions**

#### ***Introduce Agenda Setting for Therapy***

At the start of each therapy session, the client can discuss how his or her week has been and bring up any issues for discussion. The therapist can introduce the concept of setting an agenda so that time is allocated both for client issues and for making progress with the tasks of therapy. This session provides the first opportunity for therapist and client to work together in setting an agenda, and begins the process of orienting the client to cognitive therapy. Setting an agenda helps avoid too much time spent in unproductive discussion and encourages the client to think about (and jot down) topics in between therapy sessions (J. S. Beck, 1995).

#### ***The Client's Injury, TBI, and Consequences of TBI***

As noted in the assessment session, following an injury to the brain, many clients are confused and distressed by their symptoms and may worry that they are going 'crazy'. It can be a great relief to learn about some common consequences of brain injury and to realise that difficulties are a result of the injury, rather than evidence of craziness. Some of the common consequences of brain injury include:

Difficulties with concentration and memory

Language problems (e.g. retrieving words, maintaining a conversation)

Difficulties in solving problems or making decisions

Problems in judging distance or spatial relationships

Physical difficulties such as clumsiness, dizziness and problems with balance

Headaches

Fatigue

Irritability and emotional difficulties

This discussion can be related to the particular problems that are specific to the client.

Some of the difficulties that the client is experiencing may arise because of fatigue and the expectation that he or she can still achieve at the same rate as before the accident.

This information can be repeated and referred to across the course of therapy, as the need arises for the client and will further assist with developing the conceptualisation

for the client. Information sheets about various aspects of TBI will be available and can be kept in the client's folder. Later in this session, the therapist will introduce an Activity Schedule, which will allow therapist and client to obtain information about daily activity levels and expectations.

### ***Client Expectations and Goals for Therapy***

The therapist will encourage the client to set some goals for therapy. This will also provide an opportunity to find out from the client what they are hoping to achieve and what they expect from therapy. Client difficulties will be the focus of therapy across all therapy sessions. A collaborative approach to therapy is regarded as essential to engaging the client in CBT (Khan-Bourne & Brown, 2003). Some client goals may be unrealistic. Rather than challenging these immediately, the therapist can gradually encourage the client to test the ideas over the course of therapy. Many clients with TBI may lack insight into some of their difficulties. Maintaining a positive therapeutic relationship can help the client to engage in the rehabilitation process, to gradually confront difficulties and form realistic goals for their future. It can be useful to discuss progress through therapy, noting that while there will be improvement, there may be times when progress will be slow, there may even be setbacks, but generally, there should be overall improvement. The therapist can raise the issue of termination of therapy by suggesting that one goal can be for the client to become confident in his or her ability to provide self therapy once these sessions have ended. The goals negotiated by the client and therapist can be reassessed where necessary. Both therapist and client can write down a record of these goals.

### ***Introduce the Activity Schedule***

In order to gain information about the client's level of activity, a behavioural task, Activity Schedule, can be set for homework. This involves the client writing down his or her activities during the week before the next session (see Figure 1, Activity Schedule p. 160). The completed schedule covers all 24 hours throughout each day and night. As well as daily activities, it is also useful to obtain a record of what is happening between midnight and 6.00 a.m., as clients who have sustained a TBI may experience disrupted sleep patterns. The completed Activity Schedule can be discussed at the beginning of the next session.

### ***Summary and Homework***

At the end of this and every session, the therapist and client can go over a summary of the session. This summary will include homework for the week in between therapy sessions. The therapist can spend time with the client writing down the homework. In this first session, it may take some time to go over this activity, as a number of clients may not be used to using external memory aids, prior to their injury. For this session, homework involves completing the activity schedule. The client may also jot down items to add to the agenda for the next session, if these come up during the week, and read information sheets about consequences of TBI.

**Figure 1: Activity Schedule**

The following table can be used for the client to complete their activity schedule.

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
6.00 – 9.00							
9.00 – 12.00							
12.00 – 3.00							
3.00 – 6.00							
6.00 – 9.00							
9.00 – 12.00							
12.00 – 6.00							

This schedule can be used to identify problem times of the day, sleeping/rest patterns, and activity levels during the week. It is also important to look at how the client spends his or her time over the weekend.

## **Session 2: Building up motivation for rehabilitation and commitment to rehabilitation activities.**

### ***Goals***

Review Activity Schedule.  
Work collaboratively to clarify and prioritise goals.  
Introduce client to the Cognitive Model and discuss its effectiveness.  
Identify obstacles to engaging in rehabilitation and in therapy.  
Conduct an Applied Behavioural Analysis.  
Introduce a cognitive task as a homework exercise.

### ***Structure of the Session***

Obtain a brief update from the client and set the agenda for the session  
Review Activity Schedule set as a homework task.  
Review goals for therapy.  
Provide the client with information about the cognitive model.  
Make a list of obstacles to engaging in therapy (e.g., difficulties with memory, attention, concentration, issues with transport...).

Analyse behavioural factors that restrict participation in rehabilitation activities.  
Discuss a cognitive task (Thought Records) and encourage client to work on this as a homework exercise.

Note: It may be necessary to use more than one session to complete the work outlined in this section.

### **Interventions**

#### ***Review Activity Schedule.***

Spend time looking at the client's Activity Schedule completed during the week. This may highlight some issues concerning unrealistic expectations about how much the client can achieve. Alternatively, the client may not be engaging in very much activity. Ask the client about what the Schedule means to them. Are they distressed/unconcerned about their level of activity? Are there times when they work well, or times when they achieve very little? This can be reviewed in relation to ensuring that activities (including therapy sessions) are scheduled at a time that maximises the client's ability to focus on the tasks required, and with respect to any recommendations outlined in the neuropsychological assessment.

#### ***Work collaboratively to clarify and prioritise goals.***

The client and therapist negotiated goals for therapy during the initial session. The client reviewed these during the week between sessions. These can be discussed, and any additional goals added to the list. Once the list is completed, then the therapist and client can work together in order to prioritise these goals.

#### ***Introduction to Cognitive Model***

One of the goals of cognitive therapy is to encourage the client to take an active part in therapy. (As an initial step, the client has been encouraged to think about and contribute

items for the agenda). With clients who have sustained a TBI, there may be some limitations as to how effectively this can be accomplished, depending on the client's capacity for problem solving, planning and abstract levels of reasoning. A description of the cognitive model will need to be tailored to the individual client. An initial step is to discuss the difference between thoughts and feelings. The therapist and client can work together to obtain a list of words used to describe various mood states. These can include words such as sad, angry, guilty, nervous and so on.

Note: If a client has difficulty in providing words to describe feelings, it may be appropriate to use symbols (e.g. 'happy', 'sad', or 'angry' faces).

Moods can often be associated with physical symptoms, such as a racing heart when feeling anxious. The therapist can ask the client to describe any physical symptoms they recognise when they are angry, sad, etc. Often thoughts and mood states can be linked. A person who is thinking that he or she has been unfairly treated may feel anger, for example. The five-part model discussed below emphasises the links between physical sensations, feelings, thoughts, actions and the overall social environment.

Cognitive processes refer to mental activities such as remembering, thinking and attending. Some ideas that may be discussed include:

The way that we interpret a situation (rather than the situation itself) will influence how we feel about that situation and how we behave.

If we can change the way we view a situation, this will change how we feel and may help us to change our behaviour.

Some of the thoughts that we have about situations may be inaccurate and unhelpful. We can learn to identify and change these unhelpful thoughts.

Work with the client to obtain examples from their own experience to illustrate these ideas. For some clients, these examples may need to be very concrete.

The Cognitive Model has been used to assist people with a wide-ranging variety of difficulties. The therapist can relate this to the conceptualisation and to specific problems experienced by the client. Discussion can also focus on how the cognitive model can be used to assist in alleviating some of these symptoms. Cognitive behavioural techniques can be of value in dealing with a number of difficulties experienced by clients with TBI (Ponsford, 1995)(Ponsford, 1995)(Ponsford, 1995)(Ponsford, 1995)(Ponsford, 1995).

### ***Identify obstacles to engaging in rehabilitation and in therapy.***

There are a number of factors that can contribute to difficulties in making a full commitment to participation in rehabilitation activities. Therapist and client can brainstorm any practical obstacles that may get in the way of the client fully engaging in rehabilitation and in therapy. These may include difficulties such as transport issues, limited attention span, memory difficulties, and difficulties in grasping new information. A number of potential difficulties will have been identified in the neuropsychological report, but it is essential to continue to work with the client in reassessing these issues. Difficulties can be ranked according to their impact on the client.

### ***Applied Behavioural Analysis***

It can be helpful to carry out a detailed analysis of behavioural problems that restrict full participation in rehabilitation activities. In this activity, specific behaviours are identified and the situation, conditions and settings in which these behaviours occur are noted. This allows for the development of a behavioural management plan (Sohlberg & Mateer, 2001). This analysis includes identification of *antecedent events*, *target behaviours* and *consequent events*. The first task is to identify specific behaviours. These may include behaviours such as shouting at others in the work/school/home environment, or cancelling appointments. It can also be helpful to identify any avoidance behaviours that may contribute to maintenance of symptoms with, for example, with anxiety disorders (Wells, 1997), or with pain conditions (Vlaeyen, de Jong, Geilen, Heuts, & van Breukelen, 2001). As well as maladaptive behaviours, it is also important to identify positive behaviours that help the client, such as going for a walk, or noting appointments in a diary. Antecedents are factors that appear to trigger either helpful or unhelpful behaviours. These could include environmental factors such as noise, or trying to complete more than one task at a time. Physical factors could include fatigue and might be related to the time of day when an incident occurs. Consequences include the things that happen after a behaviour has occurred. These often include the responses of those present at the time, e.g., work-mates, family members.

With those who have sustained a brain injury, further steps are necessary (Sohlberg & Mateer, 2001). It is important to identify and compensate for cognitive factors that may affect behavioural interventions (e.g., distractibility, memory problems). It is also important to assess the setting (e.g., work environment), and to identify persons who are able to assist with the intervention (e.g., a work-mate, family member). Targeting adaptive behaviours that will improve engagement is an important part of the intervention. A change in the frequency of identified behaviours can be encouraged through antecedent control (e.g., making changes in the environment, reducing task demands) or by altering consequences (e.g., social reinforcement of adaptive behaviours).

### ***Introduce a cognitive task as a homework exercise.***

In discussing the cognitive model, a connection has been made between thoughts, feelings and behaviour. Reinforce this by discussing the Five-Part Model (see Figure 2a, p. 165). The model shows how thoughts, feelings, physical sensations, behaviour and outside influences are all interconnected and influence our sense of well being. If any one part of the model is modified, this affects the whole model. However, there is a choice as to where we can intervene. The interpretation of a situation is often expressed in our Automatic Thoughts (ATs).

ATs occur spontaneously for all of us and are generally quite brief. Usually, we are able to do a reality check on these thoughts. When we are distressed, it may be more difficult to look at negative ATs in an objective way. While some events are almost always upsetting (e.g. personal rejection, failure), people with psychological disorders often misinterpret neutral or even positive situations (Beck, 1995). A client may be more aware of the emotion associated with an AT than the thought itself. In order to assist with identifying automatic thoughts, the therapist can ask the client what was going through his or her mind, when they notice a change in emotion, or when the client is describing a difficult situation. (For TBI clients, this often happens when they

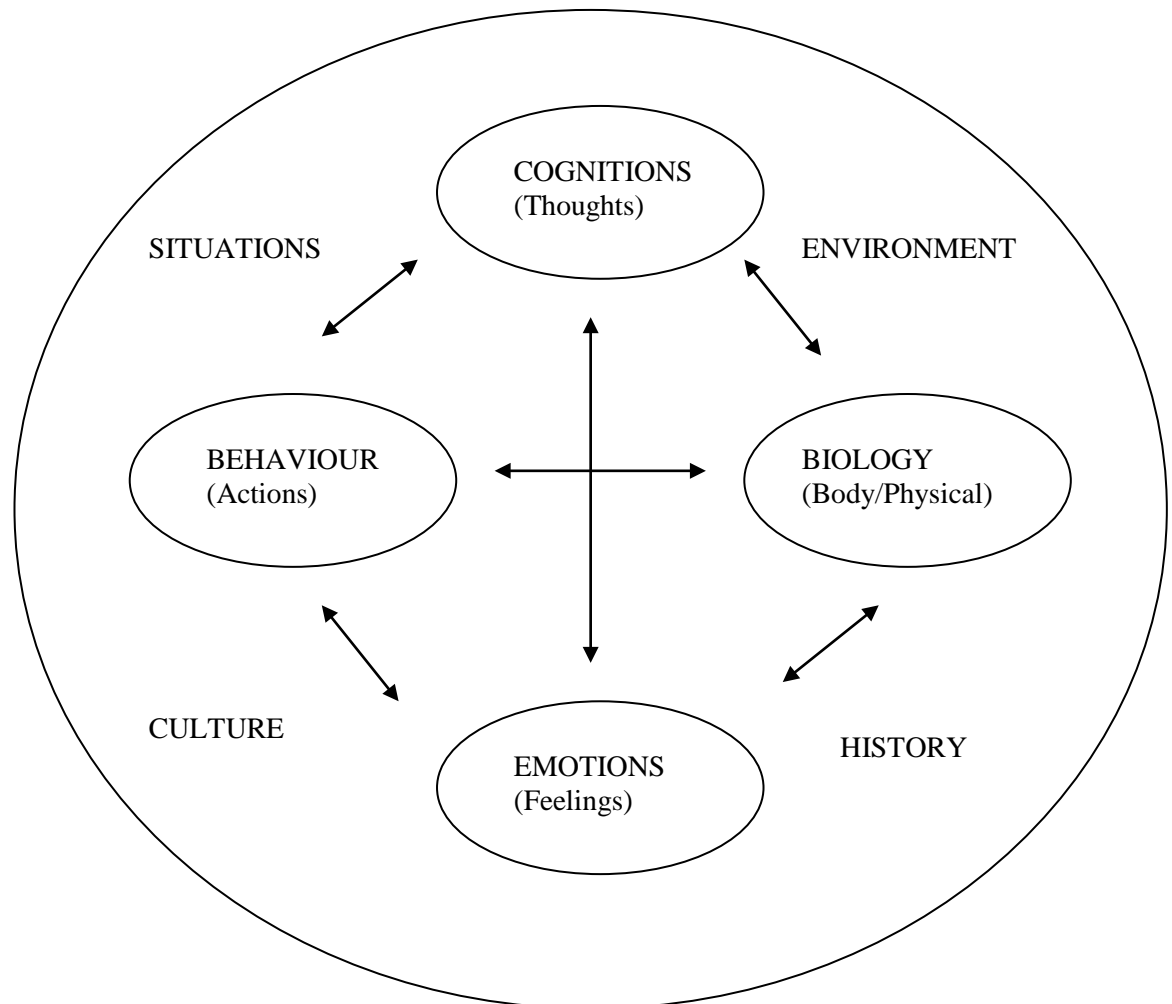


experience frustration in attempting a task that was previously easy. This frustration may be overwhelming). The therapist can ask the client to recall the thoughts that went through their mind at that time. These could include thoughts that they will never again be able to manage these simple tasks, which can lead to strong feelings of loss and anxiety.

As a homework task, the client can try to identify and record any ATs that they notice over the course of the week. As well as the thought, they can record the date and time when the AT occurred, and the situation at that time. (See Figure 2b, p. 166). This worksheet will be extended over the next few sessions in order to include recording and rating emotions, and eventually, in order to record an alternative response to the AT and the outcome.

*Figure 2a. The five-part cognitive model.*

## THE COGNITIVE MODEL



This model represents the way in which a person's thoughts, physical reactions, feelings, actions and social environment interact and affect each other. The overall bubble, which represents the social environment, includes personal history, culture, and specific situations.

This model has been adapted from Greenberger and Padesky (1995), p. 4.

**Figure 2.b. Thought Record Sheet.**

THOUGHT RECORD

Date/Time	Situation	Feelings	Automatic Thoughts

## **Session 3: Recognising and coping with depression, anxiety and other problematic issues.**

### ***Goals:***

Using cognitive models in order to describe depression, anxiety or other referral issues.  
Learn relaxation skills.  
Discuss a regular schedule to practise relaxation.

### ***Structure of the Session***

Update, mood check, agenda.  
Go over Thought Record homework.  
Continue to develop the cognitive model, discussing how symptoms of depression and anxiety, can be influenced by thoughts, feelings and behaviour.  
Try a relaxation exercise.  
Discuss homework, setting regular times to practice the relaxation exercise.

### **Interventions**

#### ***Using Cognitive Models in order to Describe Depression, Anxiety, or other Referral Issues.***

The client will have been assessed and referred for psychotherapy to assist with specific psychological issues. The therapist can discuss the way in which the cognitive model can be used in order to describe the way in which psychological symptoms (e.g., depression, anxiety) can arise and are maintained. The cognitive model can be used with depression (Persons et al., 2001), anxiety (Wells, 1997) and psychosis (H. Nelson, 1997). The cognitive model can also be used for sleep disturbances (Morin & Espie, 2003), which may compound neurocognitive difficulties following TBI (Thaxton & Myers, 2002). The cognitive model hypothesises that it is a person's perception of events, rather than the events themselves, which impact on their emotions and behaviours (Beck, 1995). Use the client's Thought Record sheet to reinforce the link between automatic thoughts and emotions. The goal is for the client to be able to identify a situation, his or her emotions and physiological responses without confusing these with automatic thoughts. The client and therapist can discuss any difficulties arising in completing the Thought Record sheet, by talking about how it can take time to learn new skills, working through the client's thoughts about this task, and by trying the task as an experiment. Encourage the client to continue with the sheet as part of the homework for the week.

Many clients have difficulty in understanding the difference between what they are thinking and what they are feeling emotionally. It may be necessary, especially with clients who have problems with self-monitoring, to spend some time discussing the words that are used to describe emotions, and asking the client to identify specific situations that can lead to them experiencing an emotion (e.g., anxiety, sadness, anger). Emotions occurring in a specific situation can be rated on a scale with 0% representing no emotion, to 100% giving the most intense emotion ever experienced. The Thought Record homework activity involves writing down the automatic thought that the client

has experienced and also identifying and rating the emotion that went with the thought. Thought record sheets have been discussed by a number of authors (Beck, 1995; Greenberger & Padesky, 1995; Morin & Espie, 2003; Persons, Davidson & Tompkins, 2001). The thought record sheet can be introduced in stages. In this session, the Thought Record sheet can be extended to include four columns, Date/Time, Situation, Automatic Thoughts, and Emotions (Beck, 1995) (see Figure 3, p.169). Two additional columns will be added in Session 4.

### ***Learn Relaxation Skills.***

The ability to relax quickly and effectively can be of benefit to a number of clients. There are a number of relaxation techniques that can be valuable to clients with a range of psychological symptoms. These techniques include breathing exercises, progressive relaxation, meditation and visualisation (Davis et al., 2000). Relaxation exercises can be taught and practised in session, where the effectiveness of a technique can be assessed for the client (Beck, 1995). Some clients do not find relaxation to be helpful and this can be discussed during the session. Relaxation training is like learning a new skill. The client could experience strange sensations such as twitching or tingling. This is a positive sign as it indicates that tension is being released. As the client learns the difference between being tense and relaxed, he or she becomes more sensitive to the feelings associated with both of these states. Again, this is positive as these feelings can be used to suggest that relaxation is appropriate. Taking the time to relax may also provide a time when anxious thoughts will surface, which could be of concern to some clients. Beck (1995) suggests that relaxation can be tried as an experiment, either it will help reduce anxiety, or it will lead to anxious thoughts, which can be evaluated.

### ***Discuss a Regular Schedule to Practice Relaxation.***

Davis and colleagues (2000) suggest selecting a technique that is helpful for the client's individual symptoms. Breathing exercises, progressive relaxation and meditation, for example, can be helpful with anxiety, while meditation can be helpful with depression. For the relaxation technique that is selected, discuss with the client, how the exercise could best fit into their weekly routine. In order for relaxation to be effective, it is helpful if the client can learn to use relaxation quickly and in a number of situations. Setting aside some time each day to practice relaxation could be a goal for the week between therapy sessions. The therapist and client can set goals concerning the number of times the client will practice relaxation over the course of the week. Reassure the client that if they have any difficulties in practising the technique, that these can be discussed at the beginning of the next therapy session.

For homework, try relaxation exercises, and continue with the Thought Record sheet, which was discussed during the session.

*Figure 3.*

**THOUGHT RECORD SHEET**

Date/Time	Situation	Emotion(s) with rating%	Automatic Thoughts

## **Session 4: Specific skills for depression, anxiety or other problematic issues.**

### ***Goals:***

Identify problematic situations.

Discuss homework and any issues around practising relaxation.

Work on client's own agenda items, review goals as required.

Revise and extend thought records.

Investigate other modes of expression (e.g., art, music, story-telling...).

### ***Structure of the session***

Note: Again, it may be necessary to spread this material over more than one session.

Update, mood check, agenda. Identify recent situations that have caused difficulty for the client, and any issues arising from the Thought Record sheet.

Discuss relaxation schedule and work on any problems encountered in practising relaxation.

Prioritise client items from the agenda. Work on top priority items. Review and assess client goals.

Extend thought record table to include 'responses' and 'current emotions'. Continue with these as a homework task, relating these to issues discussed in this session.

Discuss other modes of expression with the client. Ask about their interests in reading matter, music and artistic expression.

As a homework task, ask the client to bring along any music, stories or artwork that has special relevance for them at this time. Continue with the extended Thought Record sheet.

### **Interventions**

#### ***Identify problematic situations.***

Discuss any recent situations that have caused difficulty for the client. The Thought Record sheet may be useful here. As well as practical issues, also focus on any situations that may have contributed to psychological distress.

#### ***Discuss homework and any issues around practising relaxation.***

Practising relaxation can be difficult initially. Some clients may find themselves very tense when they first try these exercises. They may find that their muscles react in unexpected ways as some tension is released, or they may find that anxious thoughts keep returning to their mind. These issues can be discussed and relaxation exercises can be practised again at this point. Recurring anxious thoughts can be placed on the client's agenda list. As the client recognises the parts of their body that become tense during stressful situations, they can learn to recognise issues that contribute to uncomfortable symptoms.

***Work on client's own agenda items.***

Spend time working on any items identified earlier in the session as causing problems for the client. Check out any practical issues that may arise with memory, attention, fatigue, understanding, and in taking part in social situations. Look for any emotional responses that arise and explore any accompanying automatic thoughts. This provides an opportunity to review and assess progress towards achieving client goals.

***Revise and extend thought records.***

In session 2, the thought record chart was introduced with columns for the date/time, situation, emotions with rating and automatic thoughts. This table can be extended to include two more columns, 'Alternative response' and 'Current emotion with rating %'. (See Figure 4 p. 172). The client should have shown some success in completing the first four columns of the Thought Record sheet before moving on to these subsequent columns. The therapist can encourage the client to select an automatic thought from the homework sheet to illustrate how to complete the rest of the table. The therapist and client can review the evidence for the automatic thought, look for alternative explanations. The final column includes any emotional response with a rating, once the action has been completed. The revised Thought Record sheet can be completed as a homework task.

***Investigate other modes of expression.***

Clients who have marked cognitive difficulties or who have trouble with abstract thinking may have problems in talking about their disabilities and emotions. (Prigatano, 1991b) has suggested that communicating indirectly with these clients can be helpful. A client may be more comfortable in discussing music, stories, or art that has meaning for them in their current situation. The therapist may wish to play some music during the session, in order to encourage the client to discuss what music they themselves enjoy. By asking the client to bring along to the session, some music, art or stories that have relevance for them, the therapist may find a way in which they can understand life as experienced by their client. If art is meaningful for a client, they could be encouraged to draw something to represent their experience.

The client can be encouraged to bring along any artwork, music or stories that they regard as being especially relevant to themselves as an additional or alternative homework task.



**Figure 4: Extended Thought Record Sheet**

**THOUGHT RECORD**

Date/Time	Situation	Emotion(s) with rating %	Automatic Thoughts	Alternative Response	Current Emotion(s) with rating %

## **Session 5: Day to day issues**

### ***Goals:***

Identify client issues.

Go over thought record homework.

Revisit other modes of expression, as relevant to individual client.

Discuss any difficulties with decision making.

Address issue of termination of therapy.

Assess progress with relaxation exercises.

### ***Structure of the session***

Update, mood check, agenda, including client's issues.

Discuss extended Thought Record sheet and address any issues arising from this task.

Spend time going over client agenda items.

Look at any art, music or story items that the client has brought along. Discuss the meaning of these items in the client's current situation.

Look at techniques to assist with making decisions.

Introduce the issue of termination of therapy.

Complete a relaxation exercise.

### **Interventions**

#### ***Identify client issues.***

When the agenda is discussed at the beginning of the session, any client issues can be identified for discussion later in the session. These may be of a practical or emotional nature. Allow time for these in the agenda, following the discussion of thought record homework.

#### ***Go over thought record homework.***

Review the Thought Record Sheet and work through any difficulties in completing this sheet. There may have been some problems with completing the two additional columns. Discuss any of these issues. Encourage the client to continue with the Thought Record Sheet for homework.

#### ***Revisit other modes of expression, as relevant to individual client.***

One of the homework tasks was to find any art, music or stories that were relevant in the current situation. Discuss any items that the client has brought along, focusing on important meanings for the client.

#### ***Discuss any difficulties with decision making.***

Explore with the client how he or she decided on which items were important to bring along to the session. This may provide an opportunity to discuss any problems with making decisions. One approach to decision making involves listing the available options along with the advantages and disadvantages of each (Beck, 1995). Once this has been done, each option can be weighed and a conclusion made about which seems to be the best.

***Address issue of termination of therapy.***

Preparation for termination of therapy and even for setbacks began as early as the first session, where an outline for therapy, mentioning the possibility of both improvements and setbacks, was discussed. This issue can be revisited in this session. Throughout the course of therapy, the therapist has endeavoured to attribute progress made by the client to the efforts they have made, in rehabilitation and in cognitive therapy. This can help encourage the client to have confidence in his or her own effectiveness. If the client is progressing well, the therapist could negotiate extending the time between sessions, as an experiment. A review of client goals and progress towards these is appropriate at this point.

***Assess Progress with Relaxation Exercises***

Complete a relaxation exercise of the client's choice in this session. Discuss progress with relaxation and address any difficulties. These exercises can be incorporated at any point in subsequent sessions, where appropriate.

***Identify issues to work on as homework. Continue with thought record or artwork as agreed by client.***

Discuss any possible practice situations that may arise during the week where the client can use decision-making skills.

Encourage the client to continue with the Thought Record. Alternatively, he or she could continue to use music, artwork, stories, or other activities as a means of clarifying feelings.

## **Session 6: Problem solving.**

### ***Goals:***

Go over client homework and identify any problem areas.  
 Introduce basic steps for problem solving.  
 Practice problem solving skills using role-play.  
 Anticipate any issues that may arise (e.g., memory, attention...)  
 Discuss Intermediate Beliefs

### ***Structure of the Session***

Update, mood check, agenda.  
 Go over homework (decision-making, thought record, self-expression), identifying problem areas for the client.  
 Outline an approach to problem solving.  
 Role-play problem-solving using a situation suggested by the client.  
 Make a list of any TBI issues that are likely to interfere with achieving goals.  
 Extend the Cognitive model by exploring Intermediate Beliefs  
 Set homework, using behavioural experiments.

### **Interventions**

#### ***Go over client homework and identify any problem areas.***

Homework over the previous week included a number of options. The client was encouraged to practice decision-making skills, to continue with the Thought Record, or to continue to use other methods (e.g. art, music, stories) as a means of expression.

Ask the client to describe any opportunities that arose for using decision-making skills. This can provide an opportunity to acknowledge any successes, and to work through any problem areas. Some cognitive issues arising due to the injury (e.g. memory, attention, concrete thinking) may continue to cause difficulty with decisions. This could provide an opportunity to discuss compensatory measures, or to acknowledge some of the changes for the client.

The Thought Record was extended in Session 4. Discuss any problems the client may have encountered in continuing with this task. Alternatively, if the client focused on alternative means of expressing his or her feelings, this is an opportunity to continue looking at how these relate to the injury and its consequences.

#### ***Introduce basic steps for problem solving.***

As well as having difficulty with making decisions, clients may also have problems with general problem solving. Problem solving is dependent on three broad processes (Evans, 2001). These include the ability to notice that a problem exists and to monitor solution implementation, the ability to develop a plan of action, and the ability to implement a plan of action. The therapist obtained a list of the client's difficulties at the first session, and subsequently, problems have been added to the agenda for each session. Some clients may have limited problem-solving skills. The therapist can provide a structure for problem-solving, involving; 1) specifically identifying the

problem, 2) brainstorming solutions, 3) selecting a solution, 4) implementing the solution, and 5) evaluating its effectiveness. A problem-solving worksheet is given at the end of this session (see Figure 5, p 177.).

***Practice problem solving skills using role-play.***

Ask the client to select a current problem that can be used to demonstrate the problem-solving process. The therapist and client can role-play working through the process. Initially, the therapist may take the lead in generating solutions, depending on the client's level of confidence. The client can be encouraged to suggest solutions as soon as he or she is comfortable with this.

***Anticipate any issues that may arise (e.g., memory, attention...)***

For homework, the client could be encouraged to implement solutions for one or more problems. The client and therapist can list any issues that may arise and discuss strategies to deal with these. Sohlberg and Mateer (2001) outline an approach for using metacognitive/self-instructional training for clients with impairments in executive function. An outline is provided on p. 27.

***Discuss Intermediate Beliefs.***

The cognitive model can be extended to include the concept of Intermediate Beliefs. These beliefs are deeper, often unrecognised understandings that the client may have about themselves and others. Intermediate beliefs are not as easy to access or to change as ATs. These beliefs may be expressed as rules, attitudes or assumptions (e.g. 'If I ask for help, others will become annoyed with me'), and may be accessed through discussion of ATs. When the client expresses an AT, the therapist can ask him or her what the thought means for them. Common themes arising in relation to a number of situations can point to Intermediate Beliefs. Identifying Intermediate Beliefs can contribute to the therapist's conceptualisation for the client.

When the therapist and client have identified an important strongly held belief, they can discuss the extent to which this belief impacts on the client. One approach to this is to list the advantages and disadvantages of holding the belief. If disadvantages outweigh advantages, the client may wish to look at adjusting this belief. The therapist and client could discuss a behavioural experiment in order to test the validity of a belief. If, for example, the client believes that others will put them down if they ask for help, the therapist could select a specific issue and suggest an appropriate person to approach for assistance (e.g. a close friend, support worker, work-mate). This could be set as an additional homework task for the week.

*Figure 5: Problem Solving*

**PROBLEM-SOLVING WORKSHEET**

*What is the problem?*

*What does this problem mean to me at the present moment?*

*What have I done in the past that has helped in similar situations?*

*What are the possible solutions for this problem?*

*Which is the best solution at the present time?*

*What steps will I take to help with this problem?*

*What happened when I followed these steps? How did I feel about the result?*

***COMPONENTS OF SELF-INSTRUCTIONAL TRAINING***

Identify the tasks or problems that cause difficulty

Identify the nature of the problem (e.g. impulsivity, lack of planning, lack of awareness)

Design a self-instructional procedure

Model doing this task

Have client practice doing the task, saying self-instructional elements aloud

Provide cue cards when necessary

When the client can independently complete the task using self-instruction, try the task using whispers

Fade whispering to inner speech

Decide whether self-instructional procedures can be generalised to other tasks

Have client keep a record of times when he or she used self-instruction

(Sohlberg & Mateer, 2001)

## **Session 7: Case management**

### ***Goals:***

Review homework and use of problem solving skills.  
 Develop appropriate concrete support plans for any anticipated difficulties that may arise. Review goals of therapy.  
 Continue with cognitive model and introduce positive thought record.  
 Discuss any issues relating to termination of therapy.

### ***Structure of the session***

Update, mood check and agenda.  
 Discuss homework, including any issues arising from problem solving and the behavioural experiment.  
 Revisit the goals that were discussed in the initial session and assess progress. Develop support plans where necessary to facilitate achieving reassessed goals.  
 Extend the cognitive model by discussing core beliefs and the positive thought record.  
 Work on relapse prevention strategies.

### **Interventions**

#### ***Review homework and use of problem solving skills.***

Go over any issues that arose in following through the problem solving worksheet during the past week. Check for any ATs or beliefs that may have impeded progress.

A second homework task was to try a behavioural experiment that tested one of the client's strongly held beliefs. Ask the client to report on this experiment (e.g. asking for help). How did the outcome impact on the belief? The client may be encouraged to devise experiments to test out other beliefs that can get in the way of achieving their goals.

#### ***Develop appropriate concrete support plans for any anticipated difficulties that may arise.***

The client (or the therapist) will have a record of the goals that were negotiated in the initial session. These can be revisited and reassessed where necessary. If some goals have not been met, the reasons for this can be discussed. The client and therapist can review the list of reassessed goals and discuss specific plans for achieving these where appropriate.

#### ***Continue with cognitive model and introduce positive thought record.***

Core beliefs refer to a person's most strongly held views about their self. These have been developed during a lifetime of interaction with other people. Some of these beliefs may have survived the client's injury, or instead may have been dramatically challenged. Over the course of therapy, the therapist and client will have collaboratively refined a conceptualisation, which includes early and recent experiences, a number of situations and the client's reactions to these, and how these have contributed to the client's current situation and beliefs about him or herself. This may have allowed for identification of the client's core beliefs.



Once a core belief has been identified, the therapist and client may decide to modify this belief to one which is more conducive to achieving the client's goals. For example, a belief "I have no control over my life" could be modified to "I have control over a number of things in my current situation". The therapist and client can work together to list evidence that supports the old belief (with reasons) and evidence that supports the modified belief.

For homework the client could list examples of positive things that he or she has done over the course of the week, with emphasis on things that support the modified belief.

***Discuss any issues relating to termination of therapy.***

The time between sessions may have been extended, following discussion in session 5. The therapist can ask for the client's ATs concerning termination of therapy. As appropriate to each individual, the client could be encouraged to consider conducting self-therapy sessions at home in between sessions, to make a list of what was learned during therapy, and to prepare for some setbacks that may happen once therapy has ended. Clients may also be reminded that they can schedule booster sessions after the therapy has finished.

## **Session 8: Termination of Treatment Sessions**

### ***Goals:***

Review treatment and goals.  
Provide feedback from therapist to client.  
Get feed back from client on most/least helpful aspects of therapy.

### ***Structure of the session***

Update, mood check, agenda.  
Go over the list of positive thoughts that was completed for homework.  
Review the treatment and the goals that were set for therapy.  
Give the client feedback on their progress.  
Encourage the client to provide the therapist with feedback  
Review plans for coping with issues arising after therapy and set a date for follow-up sessions.

### **Interventions**

#### ***Review treatment and goals.***

The initial goals for therapy have been reassessed over the course of therapy. This session provides a final opportunity to see which goals have been achieved, and which have proved more difficult. For goals that the client may still wish to work on, the therapist and client can outline an approach to these. The client can be encouraged to use the problem solving strategies that were covered in therapy.

#### ***Provide feedback from therapist to client.***

The therapist can provide the client with feedback on their progress throughout therapy, emphasising their achievements and successes, and indicating areas that the client may still wish to focus on.

#### ***Get feed back from client on most/least helpful aspects of therapy.***

The therapist can ask the client for feedback about therapy, including which were the most and the least helpful aspects of therapy. The client can discuss any concerns they have around termination of therapy.

**Appendix 2.**

**HOMEWORK SHEETS**

**ASSESSMENT SESSION**

**Homework:**

Read over your summary of the session.

Read the handout on Cognitive Therapy routines.

Write down any goals for therapy.

Goals:

Write down any questions you have about traumatic brain injury.

Questions:

Complete the Baseline Measurements.

**Baseline measurements**

At the end of the Assessment Session you completed two questionnaires.

The **Hospital Anxiety and Depression Scale (HADS)** assessed whether you were feeling anxious or depressed at that time.

Complete this questionnaire two more times before we start the therapy programme. The questionnaires are in your therapy folder.

**Dates:**

**Time 1:** \_\_\_\_\_

**Time 2:** \_\_\_\_\_

Use the stamped addressed envelopes to return these questionnaires to the Massey University Psychology Clinic.

The **Patient Competency Rating Scale (PCRS)** assessed how confident you were feeling about everyday activities. You will be asked to complete this questionnaire again during the therapy programme.

## **SESSION 1. Introduction.**

### **Homework:**

Complete the Activity Schedule.

Comments:

Read your summary of the session and the list of goals for therapy.

Comments:

Read the handout on Traumatic Brain Injury.

Questions:

Write down any agenda items for the next session.

Topics for next session:

## **SESSION 2. The Cognitive Model.**

### **Homework:**

Read your summary of the session.

Look at the diagram of the 5-part model. Write down any questions about this model.

Questions:

Complete the Thought Record Sheet. Try to find at least one example for this sheet.

### **SESSION 3. Reactions to injury.**

#### **Homework:**

Read your summary of the session.

Continue with thought record sheet.

Practice relaxation exercises.

Comments:

**SESSION 4. Cognitive skills.**

**Homework:**

Read your summary of the session.

Continue with the extended Thought Record Sheet.

Find any music, artwork, or stories that have meaning for you in your current situation.



## **SESSION 5. Day-to day skills.**

### **Homework:**

Read your summary of the session.

Continue with the Thought Record Sheet.

OR: continue to find artwork, music or stories that have meaning.

Find an opportunity to practise decision making skills.

What was the situation?

What were the options?

What were the advantages and disadvantages of each option?

What decision did you make?

## **SESSION 6. Problem solving.**

### **Homework:**

Read your summary of the session.

Find an opportunity to try the problem solving approach.  
Comments:

Work with one of your rules.

Describe this rule:

What are the advantages and disadvantages of having this rule?

Try out an experiment to test out this rule.

What happened in this experiment?

## **SESSION 7. Strongly held beliefs.**

### **Homework:**

Read your summary of the session.

Describe one of your strongly held beliefs.

What is this belief?

Describe an alternative belief.

Make a list of positive things that support this belief.

Make a list of some things you have learned in therapy.

**SESSION 8. Finishing therapy.**

**Follow-up work:**

Read over the summaries from your therapy sessions.

Try to use the skills from therapy to assist in your day-to-day activities.

Make a list of the dates for follow-up sessions in your diary.

## **Appendix 3.**

### **EDUCATIONAL HANDOUTS**

#### **ANGER AND IRRITABILITY**

A common complaint following Traumatic Brain Injury (TBI) is a reduced ability to manage frustration and anger. Those who have had a TBI may become irritable and easily lose their temper. The anger may be completely out of proportion to the situation, and can even occur with trivial events. Anger may range from shouting and yelling to physical aggression towards belongings, or violence towards others.

Problems in controlling anger may persist for many years following the injury. These difficulties contribute to problems in establishing and maintaining personal relationships, sustaining employment, and taking part in social and leisure activities. They can also cause a lot of stress for family members. Learning strategies for anger control can be a great advantage.

Even those with mild injuries may show much more irritability than before the accident. Those with moderate to severe injuries may have even more outbursts. Change may also be seen with the injured person's control of emotions. They may have depressed or elated moods, indifference, or anxiety and panic attacks, all of which may fluctuate rapidly.

Family and friends may not realise that these changes are a direct result of the brain injury. They also may not realise that the injured person can not have the ability to recognise that their behaviour has changed. Even if the person does realise that their behaviour has changed, they may not be able to alter the situation. Families can benefit from thinking of the outburst as temporary and separate from the injured person, and from not taking angry outbursts too personally. It can also be useful to assist the injured person in recognising the signals that show when their frustration or irritability is increasing. The family can help to identify situations that provoke frustration and to keep these to a minimum.

#### **Common situations for angry outbursts**

Angry outbursts may occur:

- When the person is tired.
- When there is a lot of noise.
- When too many people are talking at once.
- When the person is in pain, such as a headache.
- When the person has too much stimulation.
- When trying to do something that is too demanding.
- When sensitive issues are being discussed.
- When having difficulty keeping up a conversation.
- When there is conflict with another person.
- When feeling criticised or put down.
- When feeling neglected.

## Improvement of anger control

It is helpful for the person with the injury and their family to keep a record of angry outbursts, where and when they occurred, what led to them, and what happened afterwards, for a period of a week, to provide a baseline record of the anger. This can identify what causes anger and also ways in which the responses of others can either fuel the anger or have a calming influence. This record provides a basis for educating both the person with the injury and family members as to how to avoid provoking anger.

The injured person may be able to learn to recognise the thoughts, feelings and bodily sensations that signal an outburst of anger. These can be used as signals to implement strategies that will avoid the anger outburst. Strategies can include deep breathing, relaxation exercises, removing themselves from the situation, either to another area of the house, or going for a walk.

If the injured person is not able to do this, the family may need to assist in identifying behaviours that signal anger. Family members can remove the source of irritation (e.g., turn off the television, change the subject) or they can prompt the person to use an agreed upon strategy. It is best if family members do not try to make a direct response back, shouting, hitting, arguing, or showing how upset they are. This may aggravate the situation. After calming down, the injured person may be very sorry. This can be an opportunity to suggest a better way of dealing with the situation next time.

The acronym ANGER can be used as a summary for the steps in the anger management process.

- A: Anticipate the trigger situations.
- N: Notice the signs of rising anger.
- G: Go through your “temper routine”. This can include relaxation exercises, breathing exercises, and finding an alternative way to handle the situation.
- E: Extract yourself from the situation, if all else fails.
- R: Record how you coped. What lessons can you learn for next time?

## Violence to others

If necessary, family members may need to physically leave the situation themselves. It can be helpful to practice a safety plan ahead.

Alcohol will make the situation worse. No Alcohol!

### References:

- Farrar, K. (1997). Education evening talk to Head Injury Society, (Wellington).
- Ponsford, J., Sloan, S. & Snow, P. (1995). *Traumatic Brain Injury: Rehabilitation for Everyday Adaptive Living*. Hove: Psychology Press Ltd.

## **ANGER**

**After the injury it can be harder to manage anger.**

**It can be easy to become irritable and lose your temper.**

**Anger may follow from even mildly annoying situations.**

**Learning strategies to manage anger can be very helpful.**

### **Common Situations that lead to Anger:**

**Being tired**

**Noise**

**Too many people talking at once**

**Headache or pain**

**Too much going on**

**Trying things that are hard**

**Discussing sensitive issues**

**Finding it hard to follow a conversation**

**Conflict with another person**

**Feeling criticised or put down**

**Feeling left out**

## **MANAGING ANGER**

**Family members can help to keep a record of angry outbursts.**

**Make a note of what causes anger outbursts.**

**What things make the situation worse?**

**What can help to calm everyone down?**

**Helpful strategies for the injured person include learning deep breathing, relaxation exercises, and going for a walk.**

**Family members can learn to remove things that cause anger (for example, turning off the television).**

**The word ANGER can be used as a reminder of steps to use.**

**A Anticipate the events that lead to anger.**

**N Notice the signs of rising anger.**

**G Go through your “temper routine”, for example, relaxation exercises.**

**E Extract yourself from the situation.**

**R Record how you coped. What have you learned for next time?**

**Keep yourself and others safe. Family members may need to leave if things get out of control. It can help to have a safety plan.**

**ALCOHOL will make the situation worse.**

**NO ALCOHOL!**



## ATTENTION

Problems in maintaining attention and concentration are common following Traumatic Brain Injury (TBI) due to damage to frontal and temporal brain systems. These areas are at risk of injury with the accelerating/decelerating forces that occur during the injury. Memory and executive functions are related to attention and are also often damaged with TBI.

### **Types of attention**

Attention consists of a number of different abilities. These include *focused attention*; *sustained attention*, *selective attention*, *alternating attention* and *divided attention*.

*Focused attention.* This is the ability to respond individually to events that are perceived through the senses, including vision, hearing and touch.

*Sustained attention.* This is the ability to maintain a consistent response during a period of completing an activity. *Vigilance* is a part of sustained attention. A person with impaired vigilance can only focus on a task for a brief period (i.e., seconds to minutes). Their performance may vary considerably even over these brief periods of time. Another important part of sustained attention is *working memory*. This involves holding working with information while it is held in memory (e.g., mental arithmetic).

*Selective attention.* This involves the ability to concentrate on a particular task, in spite of distractions. A person who experiences *distractibility* is easily interrupted by sights, sounds, other activities or internal matters such as worries and discomfort.

*Alternating attention.* This refers to the mental flexibility that is needed to shift the focus of attention and move between a number of different tasks. These activities involve working memory. Following a brain injury, it can be difficult to change activities once a person is 'set' on one particular task. This is referred to as *perseveration*. Everyday activities regularly call for the ability to move between a number of activities (e.g., filing items and answering the telephone).

*Divided attention.* This is the ability to work on more than one task at a time. Two or more activities may be required and a number of types of information may need to be monitored (e.g., cooking a meal and talking to a child). This can involve rapid alternating attention or using automatic processes for one of the tasks.

### **Managing problems in attention**

One option for managing attention difficulties is the use of compensatory strategies and environmental supports. These are particularly useful when a person is moving back into home and work environments.

### **Self-management strategies**

Following brain injury, it may be difficult to process information automatically. This means that it is necessary to use deliberate efforts to focus carefully on activities that may previously have been automatic. A person can assist with this process by *Using orienting procedures*: This involves monitoring an activity by checking what is involved at each step (e.g., checking what items are needed, what the destination is, and that windows are closed, and appliances such as heaters, are turned off before leaving the house).

*Pacing*: It may be difficult following brain injury to cope with fatigue or to maintain attention over a prolonged period of time. Pacing strategies involve developing realistic expectations about what can be achieved over a given period of time. It can be helpful

to build in regular breaks at set time intervals, or after completion of a defined portion of a task. A person who is skilled at monitoring fatigue and attention levels can learn to take a break when fatigue levels rise or when attention levels are low.

*Keeping notes:* Switching between tasks or maintaining a train of thought can sometimes be difficult. Learning to jot down key questions or ideas that come to mind can be useful if this is a problem. Making tape recordings or notes on an electronic organiser can be another option.

### **Environmental supports**

Setting up the environment in order to minimise the effects of attention difficulties can be extremely helpful. Two methods that can assist with this process include

*Task management strategies:* The first step is to identify what tasks are affected by difficulties with attention (e.g., completing a task in a noisy environment). Make a list of “helpful” and “unhelpful” environments. When possible, it is better to choose the more helpful environment. Other strategies can include turning off the radio or television, closing curtains and using earplugs.

*Environmental modifications:* These include changing the physical work-space in order to reduce the demands on a person’s attention. This can include tidying away unnecessary clutter, organising and labelling cupboards, and setting up filing systems, for example.

### **External devices**

Devices that can be helpful for those with attention problems include:

Calendar systems with day planners.

Written checklists

Electronic organisers

Voice activated message recorders

Various specific devices (e.g., pill box reminders, key finders, watch alarms).

Note: These devices are also useful for problems with impaired memory, and planning abilities.

### **Reference**

Sohlberg, M.M. & Mateer, C.A. (2001). *Cognitive Rehabilitation. An integrative neuropsychological approach*. New York: The Guilford Press.

## **ATTENTION AND CONCENTRATION**

**There are a number of different types of attention.**

### *Focused Attention*

**This means being able to focus on the things that you see, hear or touch.**

### *Sustained Attention*

**This means continuing to focus on a task until it is finished.**

### *Selective Attention*

**This means being able to complete a task in spite of any distractions.**

### *Alternating Attention*

**This means shifting your focus of attention from one task to another.**

### *Divided Attention*

**This involves working on more than one thing at a time.**

**After a brain injury, it can be hard to maintain attention.**

**Sustained attention, alternating attention and divided attention may be very difficult.**

## **MANAGING ATTENTION PROBLEMS**

### ***Self Management***

#### **Using Routines:**

**This involves checking what is needed at each step (for example, checking that windows are closed and heaters are switched off).**

#### **Pacing:**

**Be realistic about what you can do and how long you can work for.**

#### **Keeping notes:**

**Make lists of what you need to do. Jot down ideas, or make tapes.**

### ***Environmental Supports***

#### **Managing your surroundings:**

**Make a list of Try to choose places where it is easy to work. things that help you to focus.**

**Make a list of things that make it hard to focus.**

#### **Changing your surroundings:**

**Tidying your workspace can help to get rid of distractions.**

**Get rid of clutter.**

**Label cupboards.**

**Set up filing systems.**

### ***Helpful Devices***

**These include:**

**Calendars and day planners.**

**Written checklists.**

**Electronic organisers.**

**Message recorders.**

**Devices such as pill box reminders, key finders and watch alarms.**

## EMOTIONAL CHANGES

Both traumatic brain injury (TBI) and mild traumatic brain injury (MTBI) can lead to emotional changes and adjustments. With mild injuries, a person may experience a range of symptoms, including mental slowness, concentration and memory problems, as well as physical symptoms (e.g., dizziness, fatigue, headache, sensitivity to noise and/or light). They may also experience crying, anxiety and depression. Some of these problems may result from trying to continue with former activities, while adjusting to altered physical and mental abilities. With moderate or severe TBI, there may be a number of emotional and psychological reactions. These can include lowered self-esteem, loneliness and depression. The changes that occur following moderate or severe TBI may impact on work, relationships, and social and leisure activities. Adjustment may involve periods of grief, anger, despair, and confusion. Emotional adaptation to the changes imposed by TBI is just as important as practical adaptation.

TBI can lead to difficulty in controlling mood states. A person may be unresponsive and show very little emotion. Alternatively, he or she may show extremes of emotion. Different reactions can include:

Impulsivity. A person with TBI may be impulsive. He or she may easily become frustrated or irritable and have temper outbursts. These outbursts may be out of proportion to the situation and may be violent.

Laughing or crying for no apparent reason.

Showing very little emotional response.

Becoming depressed. This may occur once a person becomes aware of consequences of the injury and its impact on lifestyle.

Becoming anxious. TBI can result in confusion and anxiety as a person attempts to resume previous activities.

Changes in emotion may be caused by damage to the structures of the brain, or by reactions to the consequences of the injury. Injury to deeper brain structures (e.g., the limbic system) may affect the way in which emotion is expressed, while damage to surface structures (e.g., frontal lobes) can reduce a person's initiative or ability to control their behaviour. A person with TBI can also experience difficulty in resuming former work and social activities. This can lead to feelings of anxiety and depression.

Psychotherapy provides a person with TBI with the opportunity to describe and discuss changes that have occurred following the injury. It also assists in identifying feelings associated with these changes. Cognitive therapy looks at the ways in which thoughts, feelings, actions, physical changes and the environment are related. It assists with skills in setting goals, solving problems, identifying thought patterns, reducing emotional distress and increasing independence.

## **EMOTIONAL CHANGES**

**Brain injury can lead to a number of changes.**

### ***Mild Brain Injury***

**Concussion can lead to a number of difficulties.**

**These can include dizziness, tiredness, headaches and sensitivity to noise and light.**

**There may be problems with memory, concentration and slowness in thinking.**

**A person may feel like crying. They may feel anxious or depressed.**

### ***Traumatic Brain Injury***

**After brain injury, it may be hard to manage your moods.**

**Different reactions can include:**

**Getting irritable and having temper outbursts.**

**Laughing and crying easily.**

**Being unresponsive.**

**Becoming depressed.**

**Becoming anxious.**

**These changes can be caused by damage to the brain.**

**A person may be depressed or anxious because of the changes to their way of life.**

## FATIGUE

Fatigue, or tiredness, is a common problem following traumatic brain injury (TBI). This is the case for mild, moderate and severe injuries. If the person with the injury has suffered some physical or cognitive impairment, or is experiencing a number of emotional changes, the additional effort required to cope with or compensate for these conditions will require a lot of energy. Fatigue has a compounding effect. When the person is tired, this may aggravate physical, cognitive and emotional problems. Learning to accept and manage fatigue can play a major part in allowing for progress with returning to former activities, or learning to adjust to new situations.

### **Managing fatigue.**

There are a number of things that will help to reduce the impact of fatigue (Ponsford, Sloan, & Snow, 1995) These include:

Building rest-breaks into an activity.

Trying to complete more difficult tasks at a time of day when fatigue levels are lowest.

Changing activities often, in order to keep up interest levels.

Changing the environment in a way that reduces distractions such as noise, bright light, clutter.

Changing a task so that only small amounts of information are required at any period of time.

Using prompts to maintain attention on a task.

Make a list of steps that need to be completed in order to finish an activity. Cross off each step as it is completed.

Allow time to repeat material that needs to be remembered. In work or study setting, it may be useful to use a tape machine, or a notebook.

Allow a realistic amount of time in order to finish an activity. This will reduce time pressure and stress.

Ask questions in order to slow down the rate at which others give verbal information. If unsure about any information, ask for clarification. Use self-talk strategies to remember what steps have been completed and which ones still need to be completed.

Learn how to identify the signs of fatigue and where possible, take a rest break in order to restore energy levels.

Learn stress management strategies and relaxation techniques.

Plan to return to activities and demands in small manageable stages.

### **References:**

Ponsford, J., Sloan, S., & Snow, P. (1995). *Traumatic Brain Injury. Rehabilitation for Everyday Adaptive Living*. Hove: Psychology Press Ltd, Publishers.



## **TIREDNESS**

**Tiredness, or fatigue, can be a problem after a brain injury.**

**It takes a lot of effort to cope with changes.**

**When a person is tired, this can make problems more difficult.**

**It is important to learn to manage tiredness.**

### *Managing Tiredness*

**A number of things can help with tiredness. These include:**

**Taking rest breaks.**

**Doing difficult tasks when you are rested.**

**Changing tasks often.**

**Reducing distractions.**

**Completing one small step at a time.**

**Using reminders.**

**Making lists of the steps needed to complete a task.**

**Allow enough time to finish a task.**

**Allow time to repeat things that you need to remember**

**Ask people to repeat instructions if necessary.**

**Know when you are tired.**

**Learn relaxation techniques.**

**Return to activities in small manageable stages.**

## FRONTAL LOBE INJURIES

The frontal lobes are part of the cerebral cortex of the brain. The region of the frontal lobes is more advanced in humans than in other mammals and is the latest part of an individual's brain to mature. The frontal lobes are responsible for an individual's ability to plan, initiate and monitor behaviour. This region has an extensive network of connections to the other areas of the brain, and acts as an executive branch of the brain that controls the function of other neural systems involved in goal-directed behaviour. Damage to these brain networks may result in "dysexecutive" symptoms, which can impact on the individual's ability to reintegrate with the community. The location of the frontal lobes in the skull makes them vulnerable to the types of injuries that occur in Traumatic Brain Injury (TBI). When the head strikes another object, the brain is thrust forward against bony protrusions in the skull.

### Frontal lobe functions

Because of their widespread connections, the frontal lobes play a part in a variety of cognitive, behavioural and emotional functions. They have a central role to play in "executive" functions. Executive functions include goal identification, and planning and organising and monitoring behaviour in order to achieve these goals. The frontal lobes are involved with various aspects of attention that are related to executive function, including working memory and alternating and divided attention. The frontal lobes are also important for flexibility, creativity and problem solving and are involved in the regulation of mood and emotion. Frontal lobe functions include

*Initiation and drive.* Cognitive systems need to be activated if a person is to perform a behaviour. Damage to parts of the frontal lobes can lead to apathy and an inability to start an activity voluntarily.

*Response inhibition.* It is also important to be able to inhibit some automatic behaviours. A person with frontal lobe damage may behave in an impulsive manner, and may have difficulty stopping an incorrect response and moving to another response that is more appropriate.

*Task persistence.* The ability to work at a task until it is completed is an important executive function, which relies on working memory. Damage to the frontal lobes may lead to difficulties with task completion.

*Organisation.* The frontal lobes are involved in the organisation and sequencing of information. They assist in clearing non-essential information from working memory, and in retrieving information in an organised fashion. Organisation is an essential requirement of goal identification, time sense and planning.

*Creative thinking.* An important aspect of problem solving is the ability to generate solutions and think in a flexible manner. Individuals with frontal lobe damage may have difficulty in understanding perspectives that are different from their own, and in generating new ideas.

*Awareness.* Awareness involves the ability to have insight into one's own actions and emotions. It also involves being able to respond to feedback from others in order to adjust behaviour. Self-awareness is dependent on frontal lobe systems. Awareness of memory and attention difficulties can provide the motivation to use compensatory strategies.

### Managing frontal lobe difficulties

Strategies for management of frontal lobe difficulties can include setting up the environment, maintaining physical well-being, and developing routines for specific tasks.

#### Organising the environment

This involves setting up physical surroundings in order to compensate for difficulties in self-regulation. Examples of environmental modifications include:

Using notice boards for day-to-day information, and creating a family message centre.

Using family planning calendars.

Having a specific space for clutter. Having clutter-free zones in work areas.

Labelling cupboard contents.

Having a bill-payment system. Using a filing cabinet for home management.

Using written reminders for a variety of home management tasks (e.g., procedures for the computer posted nearby).

#### Maintaining physical well-being

When a person is physically uncomfortable cognitive impairments, especially executive impairments become more noticeable. Maintaining physical well being involves:

*Nutrition.* Maintaining a well balanced diet is important. It can also be helpful to avoid substances such as caffeine and alcohol. Drinking plenty of water helps prevent dehydration.

*Sleep hygiene.* Many individuals with TBI experience disruption to sleeping patterns. Maintaining good sleep routines and learning relaxation techniques can help improve sleep quality. Sleep deprivation worsens frontal lobe difficulties.

*Activity level.* Over-stimulation can lead to an increase in cognitive difficulties. Removing unnecessary stimulation can help with attention and concentration. Setting a realistic pace that allows enough time for rest breaks can help avoid high stress levels. Returning to work part-time is an example of pacing activity levels.

#### Developing routines

Developing routines for daily activities can help to make these easy to complete and eventually to become automatic. A number of steps can help with this process:

*Identify the steps involved.* Break the routine down into a series of simple steps.

*Make a checklist.* Write a list of these steps so that they can be checked off once they are completed.

*Practice each step.* Make sure that you know how to complete each step without making mistakes.

*Put the steps together.* Work through the complete routine until it becomes an automatic activity.

#### **Reference:**

Sohlberg, M.M., & Mateer, C.A. (2001). *Cognitive Rehabilitation. An integrative neuropsychological approach.* New York: The Guilford Press.

## **PLANNING AND MANAGEMENT**

**Accidents that cause brain injury often damage the front areas of the brain.**

**These areas are known as the frontal lobes of the brain. They control your ability to plan and organise what you are doing.**

**The frontal lobes control:**

**Starting a task.**

**Working at a task until it is finished.**

**Stopping unwanted behaviour.**

**Organising information.**

**Finding solutions.**

**Being aware of when you need to make changes.**

### ***Managing Frontal Lobe Difficulties***

**With frontal lobe injuries, it may be hard to plan and organise daily tasks.**

**There are a number of ways to help with these difficulties.**

### ***Organising your surroundings***

**This can include:**

**Using notice boards and message centres.**

**Using planning calendars.**

**Having spaces for clutter. Keeping work areas tidy.**

**Labelling cupboards.**

**Using a bill payment system. Having a filing cabinet.**

**Using reminders for home-management tasks.**

*Keeping healthy:*

**Eat a balanced diet. Avoid caffeine and alcohol. Drink plenty of water.**

**Get plenty of sleep.**

**Allow time for rest breaks.**

*Developing routines:*

**Break tasks into simple steps.**

**Make checklists for these steps.**

**Practice each step.**

**Put the steps together.**

## MEMORY

Memory is one of the cognitive functions that is often altered following Traumatic Brain Injury (TBI), due to damage in a number of systems in the brain, including the frontal and temporal lobes of the brain as well as some other structures (e.g., the cerebellum which influences movement).

### **Memory processes**

Memory function relies on the co-ordination of a number of processes. These include *attention, encoding, storage* and *retrieval*. A brief description is given for each of these processes.

#### Attention

Attention includes alertness and arousal, as well as the more advanced processes such as sustained, selective, alternating and divided attention. Working memory is part of the attention process. With the widespread damage that results from TBI, there may be decreased arousal, alertness and sustained attention. This disrupts the memory processes, as attention is necessary in order to form an initial memory trace of a particular object or event.

#### Encoding

Encoding is the processing of an item to be remembered. Remembering verbal information involves paying attention to sounds and meanings, whereas encoding visual material involves paying attention to colour and design. An item that is processed in a more thorough fashion is more likely to be remembered than one that is just processed at a surface level. For example, with a list of words, attention could be paid to the shape, the sound or the meaning of these words. Paying attention to the meaning represents a deeper level of processing. Words that are processed in this way are more likely to be remembered than words where attention is focused only on the shape of the word. A person with damage to the parts of the brain involved in understanding and organising verbal material will have difficulty remembering because they have not sufficiently processed the material.

#### Storage

Storage refers to transferring a temporary memory to a location in the brain for permanent retention. Storage can be disrupted when there are problems with the learning process. If a person has damage to temporal lobe structures in the brain, they may have difficulty in keeping items in storage. Their long-term memory can be impaired and they may forget items very easily.

#### Retrieval

This refers to searching for existing memories. Recognition of items is often easier than straight recall. Retrieval is influenced by the frontal lobe structures of the brain, which are involved in planning, self-monitoring, organisation and starting the retrieval process. As TBI often damaged the frontal lobe structures, it can also affect a person's ability to retrieve information from memory.

### **Memory systems**

#### Short-term memory

Short-term memory allows for the storage of a few items (3-5 items) for a short period of time. It represents what a person can hold in their mind before they are interrupted. Information in short-term memory may be encoded and transferred to long-term memory, or it may drop out of storage completely. Short-term memory is similar to working memory, however, working memory includes the ability to both hold and manipulate information.

#### Long-term memory

Long-term memory can store a very large number of items for long periods of time. There are a number of ways in which information can be stored in long-term memory. *Declarative memory* includes *semantic* and *episodic memory*. *Semantic memory* refers to knowledge about the world, including word meanings, facts and ideas. *Episodic memory* is recall of personal experiences that are related to particular times and locations. Following brain injury, a person may be able to remember old knowledge from semantic memory, but may have difficulty in creating new knowledge because of problems with episodic memory.

*Procedural memory*, which is memory for performing actions and learning rules and sequences, is often well preserved following brain injury. A person with severe memory impairment can learn skills without needing to recall the training. One example of procedural memory would be learning to use a computer.

### **Managing memory deficits**

#### Learning more effectively

Learning material in an effective fashion can improve memory performance. A number of strategies can be used in order to improve learning. These include

Minimising interference by learning in an environment that is free from distractions.

Controlling the rate of learning by focusing on one piece of information at a time.

Repeating and rehearsing information improves attention and assists with learning. The more time that is spent in learning, the more information is retained. Over-learning refers to continued rehearsal of material after it is mastered. Material that is over-learned is generally remembered easily.

Learning is more effective if learning trials are spaced over time, as opposed to trying to learn information all at once. A large number of short learning periods can be helpful.

Using cues can be an effective method of learning. Initially, cues can give most of the information to be learned. Over time, cues can be faded as fewer and fewer cues are necessary. Practical examples of cueing can be as simple as leaving medication by the kettle so that it will be remembered in the morning.

Errorless learning, which ensures that an item is practised correctly each time can help to reduce confusion and prevent incorrect procedures from being stored in memory.

#### Enriched processing

There are a number of internal methods (mnemonics) that can be used to assist memory. These include:

Phrases or poems where the first letter functions as a cue (e.g., “every good boy deserves fruit”)

Words that are formed from first letters (e.g., “roygbiv” for the colours of the rainbow).

Creating a story that contains all the information to be learned.

Using rhymes (e.g., 30 days hath September, April, June and November...).

Using visual memory where items to be learned are visually placed in a location of a well-remembered pathway (e.g., walking through the rooms in your house).

Associating a word with a related word and generating an image (e.g., Smith with blacksmith).

Using organisation and diagrams to connect words or ideas that need to be remembered.

#### External memory aids

Some problems with a number of the internal methods described above are that they required motivation and often complex planning. It may also be necessary to use memory in order to interpret them. External memory aids have the advantage of not needing to be interpreted in this way. External memory aids can include:

Memory diaries.

Alarms.

Tags and other cues.

Lists.

Organisers (e.g., pill dispensers).

Electronic notebooks.

### **Metamemory**

This is a person's knowledge and awareness of their own memory processes. It includes knowing which techniques are the most effective. A person with TBI benefits from knowing how tired they can become before they experience memory problems or their attention wanders. Knowing which time of day is best for learning can help with remembering material. It is also helpful to know how to adapt techniques to new tasks. Metamemory is one of the most important components of improving memory function.

### **References:**

Matlin, M.W. (1998). *Cognition (4<sup>th</sup> ed.)*. Fort Worth: Harcourt Brace.

Sohlberg, M.M., & Mateer, C.A. (2001). *Cognitive Rehabilitation. An integrative neuropsychological approach*. New York: The Guilford Press.



## **MEMORY**

**Memory problems often occur after a brain injury. This is because the areas at the front and side of the brain are often damaged during accidents. These areas are important for memory.**

### *Memory Processes:*

**A number of processes are important with memory.**

#### **Attention:**

**It is important to be able to pay attention to something that you want to remember.**

#### **Encoding:**

**Remembering words involves noticing sounds and meanings.  
Remembering what you see involves noticing colours and designs.**

#### **Storage:**

**Storage involves moving a recent memory to a part of the brain used for long term placement.**

#### **Retrieval:**

**This involves finding memories that are stored in the brain.  
Recognising words or events is often easier than recalling them.**

## **MANAGING MEMORY DIFFICULTIES**

**There are a number of ways to improve your memory.**

**These include:**

**Learning in a quiet place.**

**Learning one thing at a time.**

**Repeating the things that you want to learn.**

**Having a number of short learning trials can be helpful.**

**Use cues or prompts to help with learning.**

**Learn something correctly at the beginning.**

## MILD TRAUMATIC BRAIN INJURY (MTBI)

Many people, who experience a mild head injury, or concussion, have unpleasant symptoms for a few days. These can include headaches, tiredness and irritability. In most cases, they are able to return to work or school after two to three weeks. However, in some cases these symptoms persist and can cause ongoing hardship.

### **Symptoms from MTBI**

The symptoms experienced following MTBI occur in physical, cognitive, behavioural, and stress related areas.

#### ***Physical symptoms***

These symptoms may include headaches, pain, difficulties with vision, senses of smell and taste, and problems with balance.

#### Headaches

Headaches can arise for a number of reasons. They can be related to bruising from the injury, fatigue, physical activity and muscular pain. Headaches may be accompanied by nausea, a stiff neck, and sensitivity to light. In the first few days following the injury, headaches can be relieved to some extent by analgesics. When a more severe headache persists for more than a week or two following injury, this may indicate a more serious injury such as internal bleeding. It is important to contact a doctor, who may make a referral to a specialist for further investigation (e.g., CT scan).

*Fatigue* can lead to headache, particularly when those with cognitive impairment need to concentrate on an activity. Stressful work periods can aggravate this type of headache. However, physical activity, where there is no stress involved, does not usually have an adverse effect. The best form of relief is rest, and sleep, if possible. Management consists of adjusting workloads and reducing sources of stress.

*Physical activity* may, however, lead to headaches in the early stages of recovery from the injury. In this situation, it is best to avoid activity that provokes the headache and build up work tolerance slowly. *Muscular pain* may be present in the neck and head area, and may cause a steady headache. This is often present at the same time as fatigue-related headache.

*Migraine-like* headaches with nausea, vomiting and light sensitivity may occur following MTBI. These can occur, regardless of whether or not they were an issue before the injury. This type of headache can be treated in the same way as for regular migraine.

*Pain* at the site of an injury such as a scalp bruise may occur in the early stages following the injury. Pain that persists is often due to a high impact injury, such as being struck by a golf ball. This pain is usually felt over a limited area. Referral to a specialist may be needed for persistent pain.

#### Visual symptoms

Visual symptoms can occur after mild head injury. These can include blurring of vision, double vision, and sensitivity to light. Most visual symptoms seen in the early

stages are mild and will clear after a week or two without treatment. When they persist, specialist advice may be needed.

*Blurring* of vision is common in the first few days after MTBI. Usually, this clears up in a week or two. Persistent blurring may be seen, often in those who are in their 40s or older. This may be more noticeable for reading than with distance vision, and can be assisted with suitable glasses. In younger people, blurring may be a temporary condition, and vision may return to normal after a few weeks or months.

*Double vision* may occasionally occur after MTBI. This may occur with fatigue. *Sensitivity to light* is common, even with indoor lighting, and especially with fluorescent lights. Wearing dark glasses may help to relieve this sensitivity.

#### Smell and taste

Damage to the senses of smell and taste may occur following MTBI. This can affect enjoyment of food, which is a major pleasure for most people. Eating habits may change, which can lead to weight loss or lack of balance in diet. If the sense of smell is affected, it may be necessary to install smoke detectors in the home, as a safety precaution.

#### Problems with balance

Dizziness, impaired balance and vertigo may be present following MTBI. With most people, these symptoms clear within a few weeks, but for a few, they can remain as a major source of disability.

Symptoms of “dizziness” may cover feelings of being out of touch with surroundings, instability when walking up stairs, poor balance, bumping into other objects, and vertigo (e.g., feelings of rotating or falling backwards when rising). This can be caused by slowed visual reactions, or by damage to the balance system.

If problems with balance, co-ordination and vertigo persist, a physiotherapist may be able to assist with a programme of exercises.

### ***Cognitive and behavioural symptoms***

Problems with cognitive difficulties and stress are common following MTBI. Difficulties may include

*Memory.* Problems with memory are among the most common complaints. Daily issues such as pots on the stove, or remembering messages can easily be forgotten. Recall of events before the injury is mostly unaffected.

*Concentration.* People with MTBI often find it very difficult to maintain focus on what they are doing. They can be easily distracted by noise, or background events. They may find it difficult to talk to more than one person, or to focus on more a task with a number of steps.

*Thinking.* A person with MTBI may notice a decrease in mental energy and may find it difficult to sort out ideas or to express them. Conversation may be disjointed.

*Fatigue.* Excessive tiredness can be a consequence of MTBI. This can increase the impact of other symptoms and limit involvement in work or other activities. Fatigue can be brought on quickly by mental effort, or any activity that needs attention. Physical effort can have some impact in the early stages after injury, but causes less of a problem as time passes. Fatigue can bring on headaches. Plenty of rest is needed to

combat fatigue, but pressure in the workplace or at home may prevent this and make the situation worse.

*Lack of insight.* Early after the injury, a person with MTBI may insist that nothing is wrong and try to return to normal activities. After a week or two, they may realise, quite suddenly, that things are much more difficult than they anticipated.

*Irritability.* Irritability, impatience and lack of self-control are common symptoms following MTBI. At home, it may be difficult to tolerate noise, and later, at work, irritability can cause major problems if minor business hassles provoke an extreme response.

*Sensitivity to light and noise.* People with MTBI may be very sensitive to light and may wear dark glasses for a while, even inside. They may also find it very difficult to concentrate on an activity when there is any background noise. Sound of any sort may be irritating.

*Loss of interest in sexual activity.* Some people find that they have little or no interest in sexual activity for some time following the injury.

*Anxiety and depression.* Anxiety can occur following any illness, and if it persists, can delay recovery or lead to depression. As physical symptoms improve difficulties in memory and concentration may become more obvious, which can be very distressing. People with MTBI may notice changes in their sleeping pattern. In the early stages after the injury, they may need a lot of sleep and may sleep deeply. However, if anxiety increases, sleep may be disturbed, leading to increased fatigue and anxiety. If progress is slow and return to former activities becomes difficult, depression can follow.

*Impact on family.* Initial reactions from families, following an MTBI, can be relief that the injury is mild. Families hope that recovery will be quick and that there will be no lasting effects. In most cases, these hopes are justified. When recovery is prolonged, families may worry about the true nature of the injury and may want more medical tests. Sometimes, those with the injury may feel as if they are going mad, with the family also concerned about this as well. Families may question whether the symptoms are real. Financial burdens may arise if the person with the injury is the main income earner. Living with symptoms can be difficult, for the person with the injury, and for the family.

## **Reference:**

Wrightson, P. & Gronwall, D. (1999). *Mild Head Injury: A guide to management.* Oxford: Oxford University Press.

## **CONCUSSION**

**Many people who have a concussion have unpleasant symptoms for a few days.**

**Usually these get better after two or three weeks.**

**For some people, these symptoms may last for a much longer time.**

### *Physical Symptoms*

**These may include:**

**Headaches and migraines**

**Tiredness**

**Pain**

**Blurred vision, double vision and sensitivity to light**

**Changes with smell and taste**

**Problems with balance**

**Dizziness**

### *Problems with Thinking*

**There may be problems with:**

**Concentration**

**Memory**

**Less mental energy**

**Lack of understanding**

### *Other Problems*

**These can include:**

**Impatience and irritability**

**Sensitivity to light and noise**

**Less interest in sex**

**Changes in mood**

**Changes in sleeping patterns**

**Difficulties with family relationships when recovery is slow**

## **Potential Neurobehavioural Consequences in Traumatic Brain Injury (TBI).**

### ***Physical***

#### Sensory and motor problems:

Following TBI, these can include slowed movements, difficulties with co-ordination, weakness or paralysis on one side of the body, and awkwardness in walking or running.

#### Visual impairments:

Problems with vision can include reduced accuracy, double vision, ability to see only part of what is presented, and blindness.

#### Neurological sequelae:

Headaches and seizures may occur following TBI, especially in the early stages of recovery.

#### Auditory problems:

Hearing difficulties can range from reduced clarity of hearing to deafness.

#### Other:

Someone who has survived a TBI may experience ongoing tiredness, excessive sensitivity to light or noise, and sometimes loss of smell.

### ***Cognitive***

#### Attention:

Following TBI, it may be difficult to maintain attention for prolonged periods. A person may find that they are easily distracted, quickly lose track of where they are and of the time, and are less aware of their surroundings. It may be difficult to do more than one thing at a time.

#### Memory:

Memory problems are common following brain injury. These difficulties can range from having problems in finding words, finding it hard to remember new information, or major difficulties in remembering daily tasks or in retaining any information.

#### Language:

Language problems can include difficulty in finding words, speaking very slowly, having problems in understanding speech and written language, and problems in speaking and in writing.

#### Visuospatial:

Following TBI, it can be more difficult to recognise faces and to co-ordinate vision and movement. Recognising where objects are located or how far away they are from each other can be more difficult than before the injury.

#### Executive functioning:

Executive functioning includes a person's ability to make judgements, to plan activities, to set goals and to assess the progress that is made in achieving these goals. These activities are demanding in that they require the ability to think in an abstract fashion and to keep a number of items in mind while working out a plan. Someone with a TBI may think in a very 'concrete' manner, by only recognising the most obvious meanings. It may be difficult to work with subtleties in meaning, or to alter an approach after making a mistake.

### ***Emotional***



Mood changes:

Following TBI, a person may experience more extreme emotions than before the injury. Their emotions may be difficult to control and may fluctuate rapidly. These emotions may include irritability and anger.

Psychiatric symptoms:

Psychological symptoms can cause distress and discomfort. Mood problems can include mild to severe depression, possibly suicidal thoughts and actions. Anxiety can be an issue as a person tries to adjust to changes or to return to their previous work and living situation. A person with TBI may become suspicious of others or even paranoid, as the environment becomes harder to manage. Following injury, there may be stress associated with reactions to the accident itself.

***Psychosocial***

Isolation:

It can be difficult to re-establish relationships with friends and family, following TBI. A person may face a number of losses, including job loss, loss of friends, or possibly separation from family or divorce. Feelings of isolation can remain for some period after the injury.

Identity problems:

The losses mentioned above can affect how a person views their identity. If it is not possible to resume work in a previous occupation, or to work at the same level, this can have a major impact as self-esteem can be tied up with a person's job status. Depending on levels of disability, it may be necessary to depend on family or others to a much greater extent than before the injury.

Sexual adjustment:

TBI can have an impact on sexual functioning. Isolation from others can reduce opportunity. Even within an existing relationship, differences can occur, either with decreased interest in sex, or with a much higher level of desire than previously. Changes in personal relationships following injury can also affect the sexual part of this relationship.

Alcohol or drug use:

Someone who has experienced TBI, may be tempted to use alcohol or drugs to relieve some of the distress associated with the emotional adjustments that follow. Unfortunately, they may also experience reduced tolerance to drug effects.

## **PHYSICAL CHANGES**

### *Problems with Movement*

**You may move more slowly. Walking and running may be difficult.**

**It may be hard to co-ordinate your movements.**

**There may be damage to one side of your body.**

### *Problems with Vision and Hearing*

**It may be harder to see or hear clearly.**

**You may have double vision.**

**You may only see part of what is in front of you.**

### *Neurological Problems*

**You may have more headaches than before the injury.**

**Some people have seizures after their injury.**

### *Other Problems*

**Tiredness is often a problem.**

**You may be sensitive to noise or bright lights.**

**Your sense of smell may change.**

## **CHANGES IN THINKING**

### *Attention*

**After your injury it may be hard to concentrate.**

**You may lose track of what you are doing.**

**It may be hard to do more than one thing at a time.**

### *Memory*

**You may find it hard to find words.**

**It can be hard to remember new information.**

**It may be hard to remember what you need to do.**

### *Language*

**It may be hard to understand what other people are saying.**

**Reading may be more difficult.**

**You may speak more slowly.**

### *Visual Problems*

**It may be harder to recognise faces.**

**It may be hard to co-ordinate movement and vision.**

### *Planning*

**After your injury it may be harder to make decisions.**

**It may also be harder to solve problems.**

**Self-control may be more difficult.**

## SEXUALITY

Sexuality issues following Traumatic Brain Injury (TBI) are often not addressed adequately due to reluctance to talk about this sensitive issue. Sexuality, however, is an important issue for all people, but particularly for adolescents and young adults. TBI often affects people in these younger age groups. TBI potentially disrupts many important aspects of sexuality, including interests and beliefs, social and relationship skills, self-esteem, and behavioural control. It can also affect libido (sexual drive) and the physical capacity to perform sexually. In the younger age groups, sexuality and relationship skills may not have been well developed prior to the injury. Even in established relationships, TBI can have an impact on sexuality, due to factors such as fatigue, personality changes, lack of awareness, and disruption to the previous balances in the relationship.

Disabilities in sexual functioning can arise in two ways. The first cause of change (organic factors) is from direct damage caused by the injury such as changes to nerve networks or the hormonal system. This can influence sexual interest, activity, responses and fertility. The second way in which the injury can affect sexuality (psychosocial factors) is through changes in relationships, social awareness and abilities, mental abilities, and through psychological reactions to the injury. If the person with the injury is already in a relationship, there may be tension arising from the partner's reactions to the injured person and changed circumstances. The majority of sexual difficulties arise from the second set of factors.

### *Organic factors*

These are due to changes in the physical or biochemical functioning of the body arising from TBI. They can include

*Sexual responses.* These include changes with arousal (erection, lubrication), climax (ejaculation, orgasm) and fertility. These are usually not altered unless there is disruption to the parts of the brain that influence hormonal regulation (hypothalamus-pituitary).

*Motor or sensory disorders.* Sexual activities may be altered due to disruption to movement or sensory systems. Movement disorders can interfere with both preparation for and participation in lovemaking activities. Attempting intercourse may be difficult or even unachievable, and may cause discomfort to the injured person and/or the partner. Deficits in sensory and perceptual abilities, or pain syndromes may also impact on the enjoyment of lovemaking.

*Coexisting injuries.* The injury may also have resulted in spinal cord damage, pelvic injuries, orthopaedic injuries, chronic pain, and injuries to nerves in the arms or legs.

*Medical complications.* Recurrent medical complications, sustained bed rest, and inactivity can result in loss of body condition. As well, a number of medications can produce side effects that influence sexual responsiveness.

*Pre-existing disorders.* Cardiac, respiratory, vascular or other medical conditions may have already influenced sexual function prior to the injury, particularly with older people. In younger age groups, drug abuse and previous injuries may be sources of sexual dysfunction.

### *Psychosocial factors*

Depending on the time in the injured person's life at which the injury occurred, there may have been little or no opportunity in which to develop an intimate relationship.

Even with well-established relationships, TBI may have a major impact on sexual function. The often inappropriate self-centred behaviour shown by those with TBI may inhibit the development of new relationships or damage existing relationships. Psychological reactions to the injury can affect sexual function. Psychosocial factors include

*Cognitive impairment.* Disturbances in skills such as self-regulation, social awareness, empathy for others, and memory may lead to inappropriate sexual behaviours towards other people.

*Communication difficulties.* Communication forms a basis for loving relationships. Communication skills may be affected by language impairments, and by inability to organise thoughts and ideas.

*Interpersonal and social skills.* These may be affected by both of the above areas. Difficulties in initiating conversation, and in responding to social cues may make it difficult to take part in dating and courting activities.

*Reactions of family and partner.* Following TBI, there is often reorganisation and redefinition of family roles. When interpersonal roles are suddenly and dramatically changed, this may impact on family communication. Families often see a person whose personality has undergone considerable change. Family members may experience fatigue, isolation, loneliness, and a change in their relationship with the injured person.

*Reactions of the injured person.* The person with the injury may recognise changes in his or her appearance, abilities, behaviour, and capacity to be in control in sensitive sexual activity. This can result in lowered self-esteem, depression, anxiety and feelings of helplessness.

### ***Management of difficulties***

A number of approaches can help with improving sexual function following TBI. These depend on the underlying causes of sexual difficulties.

#### Medical approaches

Consultation with an appropriate medical specialist can help with a number of the problems impacting on sexual function. Physiotherapy may help with movement difficulties, while orthopaedic injuries may require surgical correction. Medications can be useful with hormonal imbalances (e.g., hormonal replacement), pain syndromes (e.g., analgesics or anti-inflammatory medications), seizures (anti-convulsants) and psychiatric syndromes (e.g., anti-depressants for clinical depression). With all medications, care is needed to use those that have minimal impact on sexual function. Any side effects should be discussed with the prescribing medical practitioner.

#### Education

This can involve both the person with the injury and partner or family members. Education can provide information about normal sexual function and changes resulting from the injury. It may be appropriate to provide training in social skills and communication strategies, and to discuss issues such as changes in self-esteem and relationships. A speech language therapist may be able to assist with difficulties in communication, while a clinical psychologist can help with social skills training and issues with self-esteem and relationships.

Education can also include discussions around the issues of contraception. Safety issues include protection against sexually transmitted diseases and sexual exploitation by

others. Social skills training can encourage assertiveness and being able to recognise how to set limits within intimate or casual relationships.

#### Managing stress, fatigue and relationship difficulties

Stress and fatigue can have an impact on expression of sexuality within an established relationship. The injured partner may experience fatigue as a consequence of the injury. Extra energy is needed in order to compensate for impairments in cognitive functions such as memory and attention, and in physical functions such as maintaining balance and performing various movements. Allowing time for rest breaks during the day can help to reduce the impact of fatigue. It is also important for the injured person to pace the return to former activities. Returning to work on a part time basis can help to reduce stress and the impact of fatigue. A partner may have additional responsibilities following the injury, in providing an income, and in providing care for the injured person and other family members. This can place an additional burden on the relationship. It can be difficult to find time to enjoy and spend together. The partner may also find it difficult to adjust to any personality changes in the injured person. Previous roles may have to be adjusted, particularly when the injured person was the main income earner in the family. If there are difficulties in communication following the injury, it may be helpful to consult a clinical psychologist with knowledge of the impact of brain injury and experience in working with couples and families.

For those who are not in established relationships, psychological assistance can help with issues such as social anxiety, social skills deficits, relaxation techniques and general adjustment issues. It may also be an advantage to take part in support groups for young people with TBI, and outside activities such as youth groups, and sports and hobby groups. These provide opportunities to practice social skills and to meet other young people.

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## **SEXUALITY**

**Our sexuality is an important part of everyday life. It can be hard to talk about any changes that affect sexuality. Following brain injury, there may be changes in relationships and also in sexuality.**

**Changes can occur in two main ways.**

**The injury can cause damage to nerve pathways. It may change the balance of the hormonal system. These are called *organic* changes. Brain injury can change relationships with other people. Difficulties in a relationship can lead to sexual difficulties. Most difficulties with sexuality come from *relationship* changes.**

### ***Organic changes:***

**Sexual responses may alter. It may be more difficult to become aroused. This may happen if there is damage to the part of the brain that influences hormonal activity.**

**Difficulties with movement may make lovemaking activities more awkward. Changes in any of the senses (for example, touch or sight) can change enjoyment.**

**Other injuries (for example, pain, spinal cord injuries) can disrupt sexuality.**

**Medical complications, bed rest and inactivity can lead to a lack of fitness.**

**Some conditions that were present before the injury can have an effect on sexuality. This may include illnesses with older people. With younger people, previous injuries or drug abuse can affect sexuality.**

### ***Relationship changes:***

**Brain injury can make it harder to notice what other people need. Having less sensitivity towards others can affect relationships.**

**Talking to others is important in forming relationships. Brain injury may affect the ability to take part in conversations with others.**

**It may be harder after a brain injury to start conversations or to take part in social activities.**

**After brain injury there can be a number of changes in a family. This can affect relationships within the family. Tiredness and loneliness can be an issue.**

**When someone changes following an injury, they may feel sad, confused and sometimes helpless. This can also affect family members and partners.**



## SLEEP DIFFICULTIES (INSOMNIA)

Survivors of Traumatic Brain Injury (TBI) may experience disruptions to their sleep patterns. There are different types of insomnia. People with *sleep-onset insomnia* have trouble in falling asleep; those with *maintenance insomnia* awaken frequently during the night; while those with *termination insomnia* wake up too early and can not get back to sleep. Insomnia may have a number of causes, including physical or emotional discomfort, underlying medical conditions, and the influence of drugs such as caffeine, nicotine or various medications.

### **Sleep hygiene**

There are some practical steps that can be taken in order to minimise sleep difficulties. These steps are referred to as sleep hygiene and are outlined below.

#### Lifestyle factors

The main lifestyle factors known to influence sleep are caffeine, nicotine, alcohol, diet and exercise. These act as stimulants to the nervous system and can cause wakefulness and interrupt sleep.

*Limit caffeine.* Caffeine can be very effective at keeping people awake. As well as coffee and tea, there are many other drinks, snacks and medications that contain caffeine. These include cocoa, chocolate bars, some carbonated drinks, “energy” drinks, and a number of over-the-counter analgesics. Caffeine effects can last for a number of hours, and it can be helpful to read the labels on food items, drinks and medications. Try to avoid caffeine for at least 4 hours before bedtime.

*Avoid nicotine.* Nicotine is also a stimulant drug and has similar effects to caffeine on sleep. While smoking appears to be relaxing, the overall effect of nicotine is arousal. Nicotine may make it harder to fall asleep and also to stay asleep. In the long-term, cutting down on nicotine should have beneficial effects on sleeping patterns.

*Limit alcohol.* While alcohol may be used for relaxation even small amounts of alcohol can have a disruptive effect on sleep. It can cause restlessness and wakeful periods, especially in the second half of the night. While alcohol may help a person to fall asleep, as it is processed in the body, withdrawal symptoms occur, causing lighter sleep. It is also possible to build up tolerance to the effects of alcohol, so that more is needed to obtain a relaxing effect. Alcohol tends to cause dehydration, which can be another cause of wakefulness.

*Diet.* Going to bed hungry can make it difficult to fall asleep. A light snack a little before bedtime can assist sleep. However, going to bed too full can also cause wakefulness. It is probably best to allow a meal to settle for a while before going to bed. Having some water to remain hydrated can be helpful for sleep. Warm milky drinks may or may not assist with sleep, but these are preferable to drinks that contain caffeine.

*Exercise.* People who are fit have a better quality of sleep, so maintaining an exercise routine of 20-30 minutes of exercise three times a week can be beneficial. However, it is best to avoid strenuous exercise just before bedtime, as this can lead to problems in falling and staying asleep. Exercising in the afternoon or early evening can improve general fitness without disrupting sleep.

#### Bedroom environment

These factors include how comfortable the bed is, the temperature of the bedroom, whether the bedroom is well-aired and distracting factors such as noise and light.

*Noise.* Unexpected and sudden noises will waken most people. People who have sustained a TBI may develop an extra sensitivity to noise. Keeping the bedroom as quiet as possible will help to promote good sleep patterns.

*Room temperature.* Extreme temperatures can disrupt sleep. A hot room (more than 24°C) can lead to restless body movements, while a cold room (less than 12°C) can make it difficult to get to sleep and to stay asleep. If possible, room temperature should be somewhere between these extremes.

*Air quality.* Fresh air can help to promote sleep. Keeping the bedroom well aired will help to prevent stuffiness in the bedroom.

*Lighting.* Too much lighting, especially bright light can be disruptive to sleep. The bedroom should not be too bright and heavy curtains may need to be used to shut out street lighting.

*Bedding.* A comfortable bed and pillows can help to promote a good night's sleep. Investing in good bedding is an advantage if sleep difficulties are an issue.

## **Medications**

Both prescription and non-prescription medications can cause insomnia. It can be helpful, as mentioned above, to check non-prescription medications for caffeine and other stimulant ingredients. Some doctors who treat brain injury tend to avoid medications (e.g., sedatives/hypnotics, antihistamines) that promote sleep as these can have a depressant effect on the nervous system, and may impact on cognitive functions such as memory. Patients with TBI tend to be vulnerable to side effects of medications as the injury can alter brain function.

There are medications that can help with sleep problems. Some doctors use small doses of anti-depressant medications with head-injured patients with sleep difficulties and have found these to be effective. These medications may produce side effects, such as difficulty in getting up in the morning. Any side effects should be discussed with the doctor.

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## **DIFFICULTY WITH SLEEPING**

**After a brain injury, sleep patterns can change.**

**It may be difficult to fall asleep. You may wake up during the night and find it hard to go back to sleep. You may wake up very early.**

**Insomnia (difficulty with sleeping) can have a number of causes.**

**Insomnia can result from physical or emotional discomfort. Insomnia can also result from medical conditions. Drugs such as caffeine, nicotine or medications can change your sleep.**

*Sleep hygiene:*

**There are some practical steps that can help to improve your sleep.**

*Lifestyle factors*

**Caffeine often keeps people awake. Tea and coffee contain caffeine. Caffeine is also found in cocoa, chocolate bars, ‘energy’ drinks and in some medications. Try not to have caffeine for at least 4 hours before bedtime.**

**Nicotine can make it harder to fall asleep and to stay asleep. Cutting down on nicotine can help with sleep in the long term.**

**Alcohol appears to be relaxing. However, alcohol can disrupt your sleep. Alcohol may help you fall asleep, but can cause wakefulness.**

**It can be hard to fall asleep if you are hungry. A light snack can help with sleep. Too much food can also keep you awake. Allow a meal to settle before you go to bed.**

**People who exercise regularly may have better sleep. However, it is not helpful to exercise just before bed. Exercising in the afternoon or early evening can help with sleep.**

*Bedroom surroundings*

**After a brain injury noise can be annoying. Keep the bedroom as quiet as possible.**

**Keep the bedroom at an even comfortable temperature.**

**Fresh air helps sleep. Air you bedroom regularly.**

**Too much light disturbs sleep. Avoid bright lights. Use heavy curtains to shut out street lighting.**

**A comfortable bed and pillows helps you to get a good night's sleep.**

***Medications:***

***Some medications can cause insomnia.***

**Check non-prescription medications for caffeine and other stimulant ingredients.**

**Check with your doctor to see if any of your medications could disturb your sleep.**

***Some medications can help with sleep problems.***

**For patients with brain injury, small doses of anti-depressant medications can be effective.**

**These medications can have side effects (for example, you may find it hard to get up in the morning).**

**Discuss any side effects with your doctor.**

## Appendix 4

### COGNITIVE THERAPY CHECKLIST

Session	Activity	Attempted	Comments
Preliminary Session: Assessment	Client History Coping strategies Mood state/safety Normalising issues Homework sheet		
Session 1 Introduction	Homework review Agenda setting Injury/TBI Expectations/goals Activity schedule Homework		
Session 2 The Cognitive Model	Homework review Prioritise goals Cognitive model Obstacles Analysis Homework - (Thought record)		
Session 3 Reactions to Injury	Homework review Specific cognitive Models Relaxation skills Homework		
Session 4 Cognitive Skills	Homework review Identify issues Client's items Thought records Music, stories ... Homework		

**COGNITIVE THERAPY CHECKLIST contd.**

Session	Activity	Attempted	Comments
Session 5 Day-to-day issues	Homework review Identify issues Music, stories ... Decision making Future setbacks Relaxation Homework		
Session 6 Problem Solving	Homework review Problem solving Role-play Intermediate beliefs Homework		
Session 7 Strongly Held Beliefs	Homework review Support plans Positive thoughts Self-therapy Homework		
Session 8 Finishing Therapy	Homework review Review of therapy Feedback therapist Feedback client		

**Additional Comments:**

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**Appendix 5.****Adherence to Cognitive Therapy Manual**

Session	Activity	P.1	P.2	P.3	P.4	P.5	P.6	P.7	P.8	P.9
Preliminary	Client History	✓	✓	✓	✓	✓	✓	✓	✓	✓
Session: Assessment	Coping strategies	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Mood state/safety	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Normalising issues	✓	✓	✓	✓		✓	✓	✓	✓
	Homework sheet				✓		✓	✓	✓	
Session 1	Homework review	✓			✓	✓		✓		
Introduction	Agenda setting	✓		✓	✓		✓	✓		✓
	Injury/TBI	✓	✓		✓	✓	✓	✓	✓	✓
	Expectations/goals	✓	✓		✓	✓	✓	✓	✓	✓
	Activity schedule	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Homework		✓		✓	✓		✓		✓
Session 2	Homework review	✓			✓	✓	✓	✓		✓
The	Prioritise goals	✓	✓		✓	✓	✓	✓		✓
Cognitive	Cognitive model	✓	✓	✓	✓	✓	✓	✓	✓	✓
Model	Obstacles	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Analysis	✓		✓	✓	✓	✓		✓	
	Homework - (Thought record)	✓	✓	✓	✓		✓	✓		✓
Session 3	Homework review	✓	✓		✓			✓		✓
Reactions to	Specific cognitive	✓	✓	✓	✓	✓	✓	✓	✓	✓
Injury	Models									
	Relaxation skills	✓		✓	✓		✓	✓		✓
	Homework			✓						✓
Session 4	Homework review							✓		✓
Cognitive	Identify issues	✓	✓	✓	✓	✓	✓	✓	✓	✓
Skills	Client's items	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Thought records	✓	✓	✓	✓	✓	✓	✓		
	Music, stories ...							✓		✓
	Homework							✓		✓



**Adherence to Cognitive Therapy Manual contd.**

Session	Activity	P.1	P.2	P.3	P.4	P.5	P.6	P.7	P.8	P.9
Session 5	Homework review		✓		✓		✓	✓		
Day-to-day issues	Identify issues		✓		✓	✓	✓	✓	✓	✓
	Music, stories ...							✓		✓
	Decision making		✓			✓	✓			✓
	Future setbacks									
	Relaxation					✓	✓			✓
	Homework					✓				✓
Session 6	Homework review						✓	✓		✓
Problem Solving	Problem solving				✓	✓	✓	✓		✓
	Role-play							✓		✓
	Intermediate beliefs				✓	✓	✓	✓		
	Homework				✓					✓
Session 7	Homework review							✓		✓
Strongly Held Beliefs	Support plans				✓	✓	✓	✓	✓	
	Positive thoughts						✓			✓
	Self-therapy				✓	✓	✓			✓
	Homework									✓
Session 8	Homework review									✓
Finishing Therapy	Review of therapy				✓		✓	✓		
	Feedback therapist				✓			✓		
	Feedback client				✓			✓		

**Appendix 6**

**Artwork: Impact of Injury for Participant 7.**



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