

Abstracts of the 29th Brain Impairment Conference, 27–29 April, 2006, Sydney

Conference Theme: Interdisciplinary Approaches to the Treatment of Brain Impairment — Addressing Mental Health, Psychosocial Recovery and New Technologies

PRECONFERENCE WORKSHOPS

WORKSHOP 1

Treatment of Emotional Disorders After Brain Injury

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Impairments of emotional expressions are well documented in patients sustaining brain injury. There is a need for programs of rehabilitation of emotional disorders related to the lesional sites affecting emotions. Neuropsychiatric symptoms such as cognitive deficits, depression, mania, anxiety, psychosis, apathy, and sleep disturbance are common after traumatic brain injury (TBI). In order to maximise treatment potential, as the interaction between cognition and emotion cannot be separated; cognitive and emotional aspects have to be integrated during rehabilitation. There are three different strategies in the rehabilitation or treatment of emotional disorders after brain injury: pharmacological, neuropsychological, or both. An extensive array of pharmacological options and neuropsychological interventions are available to treat a wide range of emotional impairment after TBI, yet there have been few controlled clinical trials to assess the effects of pharmacotherapy and neuropsychological interventions in TBI patients. This workshop provides the fundamentals for the rehabilitation of the impaired emotional dimensions of acquired brain injury.

WORKSHOP 2

People with Brain Impairment Accessing the Internet?

Linda Worrall

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The University of Queensland, Australia*

The Internet (including e-mail) is an essential modern day tool for communication, information, leisure, education, and employment. People

with brain impairment have reduced participation in many of these domains. How can access to the Internet help people with brain impairment achieve their participation goals? What is the role of professionals in helping people with brain impairment access the Internet? This interactive 3-hour workshop will begin by framing accessibility within the International Classification of Functioning Disability and Health (WHO, 2001). Accessibility is therefore seen as a complex dynamic interaction between the person with the disability and their environment. Using this framework, participants will discuss potential barriers and facilitators to people with brain impairment accessing the internet. Two potential interventions will then be demonstrated. A train-the-trainer project using a communication-friendly Internet training manual will be described and demonstrated as well as tools to devise more accessible websites for people with brain impairment. Workshop participants will use the tools to evaluate several websites designed for people with brain impairment. A discussion about the role of professionals in assisting people with brain impairment to access the Internet will then be facilitated.

WORKSHOP 3

Using Our Brains to Understand Human Behaviour

Les Koopowitz^{1,2}

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As mental health clinicians we are afforded a cross-sectional glimpse into the ‘maladaptive’ behaviour of our patients. From this glimpse we are expected to make a diagnosis, speculate as to the ‘cause’ of the ‘disorder’, and formulate a management plan. Regulatory authorities demand this process be completed in a cost-efficient, scientific and evidence-based manner. To comply, we rely on empirically devised, categorically-based diagnostic classification systems. Are we at a point where we can use the evidence from developmental and evolutionary neuroscience to understand how the impaired brain uses universal survival instincts to deal with conditions such as traumatic brain injury (TBI)? Could it be that what we view as ‘pathological behaviour’ following a TBI may be an adaptive response to deal with what the injured brain now perceives to be an overwhelming environmental demand? Could it be that by labelling these individuals with a mental illness and bestowing upon them DSM-IV diagnoses, and the accompanying trappings and psychotropics, may sometimes not be the most helpful approach? Why is it that in the everyday clinical practice of psychiatry and its related fields we appear to pay surprisingly scant attention to the wealth of research findings being generated in the areas of developmental and evolutionary neuroscience? Could it be that the notion that we are not the rational and logical beings our ‘neocortical shell’ will have us believe is, too threatening a concept? Could it be that because, as ‘professional’ caregivers who should be able to ‘think’ about our ‘feelings’, and exert some sort of control over our response to our emotions, the thought that the tenuous ‘neocortical-striatal control’ we have over our ‘brainstem-hypothalamic-limbic-motor-striatal reflex responses’ differs from our patients to a large extent only in the efficiency of the dynamic ‘connectivity’ of this neural circuitry, creates in our own psyche too great a feeling of ‘dis-ease’?

WORKSHOP 4

Brain Injury and Mental Health Issues: Managing Challenging Behaviours, Challenging Settings, and Challenging Systems

Glenn Kelly, Suzanne Brown, Kathryn Hoskin, Jan Loewy, and Jenny Todd

Acquired Brain Injury Behaviour Consultancy, Australia

Challenging behaviours are a common adverse consequence of acquired brain injury (ABI). Coexistent mental health issues complicate the picture further. Behaviour management efforts can be thwarted on several fronts: multiple and complicated causes of behaviour, difficulties of getting accurate diagnoses to inform treatment, and difficulties engaging appropriate services, sometimes across multiple funding or bureaucratic 'silos'. The ABI Behaviour Consultancy has extensive experience in the management of challenging behaviours in community settings. Common referrals include verbal and physical aggression, inappropriate social and sexual behaviours, and lack of initiation. Consultancy clients present with a diverse range of brain injuries (e.g., trauma, hypoxia, stroke) and psychiatric symptomatology (e.g., depression, anxiety, psychosis, personality disorder, substance abuse). This workshop is targeted at people working in community settings with this complex client group. It will consider the prevalence of comorbid brain injury and mental illness. Then, small groups will work through the management of actual cases following three main themes: assessment/disentangling (determining what is a problem and why, and what the likely causes are), treatment (who is responsible for doing what, and when), and engagement — addressing the 'real-world' difficulties of working in unstructured settings and across multiple service systems, establishing responsibilities, and getting attention from services and bureaucracies.

WORKSHOP 5

**Learning About Evidence-Based Clinical Practice:
A Training Program for Clinicians to Become Raters on PscyBITE™**

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PscyBITE™ (www.pscybite.com) is the psychological database for brain impairment treatment efficacy. Published reports of nonpharmacological interventions targeting psychological consequences of acquired brain impairment are rated for methodological quality using the PEDro Scale and listed on PscyBITE™. The purpose of this half-day workshop is to train raters in the use of the PEDro Scale to rate three types of studies listed in PscyBITE™: randomised controlled trials (RCTs), non-RCTs and case series. The conceptual framework of evidence-based practice forms the contextual setting of the training program. The content and structure of the PEDro Scale are presented in detail during the first part of the workshop. The workshop facilitator will then demonstrate how to use the scale on selected research papers, with specific illustrations and examples of how the 11 criteria of the PEDro Scale are applied. Participants will then engage in a small-group exercise rating a research paper. The results of the group exercise will be discussed and utilised to further clarify the use and application of the PEDro Scale. Following this

discussion, participants will engage in a second group exercise, followed by a final discussion and clarification of issues. At the conclusion of the workshop, participants will be asked to complete an accuracy test in order to evaluate their competency as a rater. The accuracy test consists of five preselected papers which participants will rate independently at home. Completed ratings are then returned to the PsycBITE™ team for evaluation. On successful completion of the accuracy test, participants will be invited to become a rater in the PsycBITE™ Network.

PRESIDENTIAL ADDRESS

Reconceptualising the Frontal Lobes: Social Cognition and Behaviour

Skye McDonald

School of Psychology, University of New South Wales, Australia

The role of the frontal lobes in mediating social behaviour has always been enigmatic. People with frontal lobe injuries can vary enormously regarding the extent to which their social conduct is disrupted. Such psychosocial changes appear to be, to some extent at least, independent of executive impairment. Historically it has been argued that the medial-orbital aspects of the frontal lobes have a greater role in psychosocial function compared to the dorsolateral regions. In this address I would like to review the evidence regarding this, specifically evidence regarding social cognition, that is, social information processing. The notion of social cognition is currently undergoing rapid expansion within the research literature. At least three different constructs have been proposed: theory of mind, or the ability to conceptualise what others are thinking and feeling; emotional processing, that is, the ability to recognise different affective states and finally; social schema or social knowledge networks that guide judgments and behavioural responses. The evidence for the specificity of each of these constructs will be reviewed and their role in mediating social behaviour will be considered.

KEYNOTE ADDRESS

Rehabilitation of Memory and Cognition After Acquired Brain Injury: The Role of Medication

Jose Leon Carrion^{1,2}

¹ *University of Sevilla, Spain*

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Three neuroimaging and neuropsychological outcome studies involving patients with severe memory disorders are presented. The combined method (TCM) of neurorehabilitation has been used. TCM is a methodological engineering process, combining knowledge on intact and nonintact brain function with cognition, emotion, behaviour and neuropharmacology. The result is a new cerebral functional reorganisation which allows the patient to recover psychological and social coherence. With TCM it is important to possess knowledge on the pharmacodynamics of cognition as well as on rehabilitation strategies. Our results indicate that some drugs have an affinity for cerebral areas associated with memory. These drugs act exactly

where needed, normalising blood flow in hypoperfused areas and thus making neuropsychological training effective. Our data shows that cognitive neurorehabilitation would follow the principle of first restoring and maintaining cerebral blood flow in the lesion site and then retraining cognitive function.

INVITED ADDRESS 1

Developing New Neuroprotection and Neural Regeneration Strategies Using Mouse Models of Neurological Diseases

Bryce Vissell

Laboratory of Synaptic Function, Behaviour and Neurological Disease and the Neurobiology Research Program, Garvan Institute of Medical Research, Australia

Our laboratory is studying mechanisms of neural plasticity, which we believe are involved in neurodegeneration and regeneration in the central nervous system. Areas of focus include first, studies of the role and mechanisms by which glutamate receptors contribute to neurodegeneration in disorders such as motor neuron disease, Parkinson's disease and memory disorders and, second, mechanisms that regulate neurogenesis and neural repair of these conditions. Our approach involves studies of mouse models of these diseases. The disease models are engineered genetically or by chemical means. We assess whether modifications to glutamate receptors alter progression of the disease process or alternatively, we determine how specific factors in the nervous system regulate neurogenesis, which may ultimately contribute to neural repair. This talk will demonstrate how we use mice to study the role of glutamate receptors in central nervous system function and we will provide data demonstrating new mechanisms that regulate neurogenesis. The studies have important implications for eventual therapy of neurological diseases.

INVITED ADDRESS 2

Predicting Neurological Disorders through Genetic Testing Technology: Opportunities and Challenges for Individuals and Society

Sandra Taylor

School of Social Work and Welfare Studies, Central Queensland University, Australia

New genetic technologies hold great promise for our understanding of normal human growth and development and future potential treatments for disorders including those of a neurological nature. DNA and predictive genetic tests are cornerstone technologies within this context. Such tests are being increasingly used to clinically diagnose individuals with symptoms of neurological disease, but also to predict whether some asymptomatic individuals will or will not develop such disorders later in life. This paper provides an overview of predictive genetic testing currently available for inherited, adult-onset, neurodegenerative disorders where the causative mutation is known; it also reviews evidence regarding the potential benefits and disadvantages of such testing for at-risk individuals. While the benefits of such testing appear clear for many of those who have undertaken it, the majority of individuals at risk of developing neurogenetic conditions have, to date, declined testing. Why might this be so? Findings from the recent Genetic Discrimination Project in Australia are presented in which 332 asymptomatic individuals who undertook predictive testing for neurogenetic disorders constituted 37% of

total research respondents. Research data regarding this group's experiences and perceptions of the benefits and disadvantages of using genetic testing technology are presented, plus comparisons with those who undertook testing regarding familial cancers and other inherited conditions. What can we learn from the individual's experience so far and what other key perspectives are relevant? A critical overview of theoretical perspectives regarding the opportunities and challenges of predictive testing technology will constitute the final segment of this presentation.

INVITED ADDRESS 3

Using Our Brains to Understand the Failure of Psychiatry in Managing Human Behaviour

Les Koopowitz^{1,2}

¹ *University of Adelaide*

² *Hampstead Rehabilitation Centre, Royal Adelaide Hospital, Australia*

(See workshop abstract, p. 2.)

INVITED ADDRESS 4

Challenging Behaviours in Community Settings: The Complex Combination of Acquired Brain Injury and Mental Health Issues

Glenn Kelly

ABI Behaviour Consultancy, Australia

Challenging behaviours can be an enduring consequence of acquired brain injury (ABI) and, for some clients and families, represent the greatest hurdle to community acceptance and reintegration. Many clients with ABI who show behavioural disturbance also have concomitant mental health issues. The extent of this can be underestimated in the brain injury service sector where the organic brain injury is presumed to be the primary contributor to behavioural disturbance. The dual presentation of ABI and mental illness presents great difficulties for those attempting to assess and treat the behaviours because there are few tools to aid reliable assessment, and few mechanisms for coordinating the multiple service systems needed for appropriate management. This presentation will describe in detail the behaviour profile of a group of people referred to a statewide behaviour management service for the treatment of challenging behaviours. Coexisting factors such as the type of brain injury (e.g., trauma, hypoxia, stroke), and psychiatric symptomatology (e.g., depression, anxiety, substance abuse, personality disorder, and psychosis) will also be described, as will recently devised tools (Overt Behaviour Scale, HoNOS-ABI) that can aid in assessment of this complex group. Treatment and service system issues will be discussed, such as the prevalence of pharmacological treatment, mental health services involvement, and consideration of whether the service system has misperceived the nature and extent of disability in these community-based clients.

INVITED ADDRESS 5

Clicking and Browsing a New Route to Community Participation Following Brain Impairment

Linda Worrell

School of Health and Rehabilitation Sciences, The University of Queensland, Australia

Who *hasn't* used the Internet or e-mail? The world is changing. The Internet is increasingly becoming a preferred mode of communication and source of information. It is a rich source of information for people with brain impairment. It is also a leisure activity, an easier path for written communication, a way to circumvent the barriers of disability, and people with brain impairment want to use it. This presentation will follow on from yesterday's workshop and present the results of our studies that have sought to train people with brain impairment (aphasia, traumatic brain injury and Parkinson's disease) to use the Internet (Egan, Worrall, & Oxenham, 2005; 2004; Stewart et al., 2004). It also describes our findings about the accessibility of websites designed for people who have had stroke and aphasia (Hoffman & Worrall, 2004; Ghidella et al., in press; Griffin, McKenna, & Worrall, 2004). It will conclude with areas for further research and suggestions surrounding the role of professionals in facilitating access to the Internet for people with brain impairment.

INVITED ADDRESS 6

Using Long-Term Support to Improve Psychosocial Outcomes After Brain Injury

Annie McCluskey

School of Exercise and Health Sciences, University of Western Sydney, Australia

Psychosocial recovery after traumatic brain injury includes but is not limited to meaningful social relationships, work and leisure activities, and routines to fill the week. For people with severe injuries, the absence of supervision and time alone are also important psychosocial outcomes, enabling the person to develop a degree of autonomy. However, allowing a person to have time alone unsupervised — particularly overnight — can be contentious and challenging for family members, health and legal professionals. Using local and international research, this presentation will (1) define care and support, (2) highlight the challenges of quantifying care and support and why few studies to date have measured these domains, (3) discuss some of the perceived risks associated with reduced care hours, and how these risks can be managed, and (4) discuss the potential benefits of reducing care hours in a planned way, particularly increased autonomy, changes in roles, daily occupations and routines for the person with brain injury, and reduced costs. Finally, implications for policy and practice, including the NSW Lifetime Care and Support Scheme, will be discussed.

INVITED ADDRESS 7

**Community Ambulation After Traumatic Brain Injury:
Automaticity of Walking and Implications for Clinical Practice**

Anne Moseley

School of Physiotherapy, University of Sydney, Australia

People with traumatic brain injury (TBI) commonly experience difficulty walking. Walking is generally slower than in the able-bodied population. Several clinical tests are used to quantify walking speed, including the 10-metre walk test and 6-minute walk test. While these are highly reliable and have good concurrent validity, they over-predict the speed used by people with TBI in real-life situations (e.g., inside a shopping centre). A striking difference between walking in the clinic and in real-life situations is the regulatory conditions. Walking in the clinical tests is a 'closed task' because the terrain is fixed, the objects and other people in the environment are stationary and there is no uncertainty, the person with TBI is able to direct their full attention toward walking. In contrast, walking in real-life situations is an 'open task' because objects and other people are moving in the environment, so the pedestrian needs to monitor the walking speed and direction of other objects/people and predict where an object/person will be in the near future in order to avoid collision. The ecological validity of clinical gait testing for people with TBI may be improved by using a dual-task performance paradigm. That is, having the person perform a concurrent cognitive and/or motor task while they are undertaking the gait test. This dual-task gait assessment may better mimic the processing demands of walking in a real-life situation. Practice in natural and more complex environments should be incorporated into walking rehabilitation programs for people with TBI.

INVITED ADDRESS 8

**Brain injury and Emotion: Integrating Cognitive Behaviour Therapy
and Neurorehabilitation**

W. Huw Williams,^{1, 4} J.J. Evans,^{2, 4} and B.A. Wilson^{3, 4}¹ *Centre for Clinical Neuropsychology Research, School of Psychology, University of Exeter, United Kingdom*² *Department of Psychological Medicine, University of Glasgow, United Kingdom*³ *Cognition and Brain Sciences Unit, Cambridge, United Kingdom*⁴ *Oliver Zangwill Centre for Neuropsychological Rehabilitation, Ely, United Kingdom*

Neurorehabilitation has transformed the lives of many survivors of brain injury. Clear systems for enabling such survivors to regain social roles have been developed. However, an ongoing area of concern is the management of emotional disorders. Either stemming from dys-regulation of emotion due to injury to specific brain areas and/or due to the reactive stresses involved in such injury. Cognitive behaviour therapy (CBT) has been advocated as an adjunct to rehabilitation. We describe use of CBT with Neurorehabilitation to illustrate how such a twin-track approach is applied within an intensive group based program — at the Oliver Zangwill Centre — for managing pain, depression and lack of emotional expression.

CONCURRENT SESSION 1: UNDERSTANDING AND TREATING BRAIN AND MIND

**Treating a Client with TBI and Health Anxiety
Using a Modified Cognitive-Behavioural Approach**

Paul Gertler

Gertler Psychological Services, Australia

People with traumatic brain injury (TBI) often present with anxiety and depression which are secondary to, or exist independently of, brain damage. There is strong support for cognitive-behavioural therapy as an effective treatment for anxiety in the general population however there is a lack of research into the application of these treatments for people with neurological disorders. This presentation discusses the case of G.G. who was referred by his treating psychiatrist for psychological treatment of health-related anxiety which he had developed following the onset of seizures many years after a TBI. His concerns included worry about future hospitalization and worry about the side effects of anticonvulsant medications. Most particularly G.G. became obsessed by his health state and developed anxiety symptoms which he then misinterpreted as symptoms of drug toxicity. The purpose of the study was to determine whether G.G. could be treated successfully by modifying a standard CBT approach to anxiety. G.G. was treated with a modified CBT approach which took into account features common to TBI such as verbal disinhibition, cognitive inflexibility, difficulty with abstract reasoning and attentional problems. Outcome was measured by client self-report of the severity of anxiety in the form of subjective units of distress (SUDS). During the 5-month treatment period G.G. made improvements in the frequency and severity of anxiety episodes. The frequency of episodes reduced from 3 days in every 4 to 1 day in every 4, and the severity of anxiety reduced by 75%. The current case provides an indication of the adjustments that need to be made to a standard anxiety treatment to take into account cognitive problems typical of TBI and the extent of improvement that can be made over 5 months of CBT.

The Rehabilitation of Executive Deficits Following Traumatic Brain InjuryMichele K. Grant,¹ Jennie Ponsford,^{1,2} and Pauleen Bennett¹¹ *School of Psychology, Psychiatry, and Psychological Medicine, Monash University, Australia*² *Monash-Epworth Rehabilitation Research Centre, Epworth Hospital, Australia*

Executive dysfunction is characterised by disorganised behaviour and planning difficulties. To date, few rehabilitation studies have specifically targeted executive dysfunction. One exception is a study by Levine et al. (2000) which used goal management training (GMT) to improve meal preparation performance in an individual with executive difficulties. GMT is a structured rehabilitation protocol that uses a hierarchy of five steps to train the individual in various aspects of goal attainment. The purpose of the present study is to investigate the clinical validity of GMT in the remediation of executive deficits in individuals with traumatic brain injury, and to determine whether any gains imparted through GMT generalise to non-targeted goal-directed activities. It aims to do this through a multiple case study design, applying GMT to an activity with which the participant is experiencing planning/organisational difficulties. Outcomes are assessed using Goal Attainment Scaling. The results for the first case study will be presented, the focus of which was on reducing weekly household shopping expenditure. Prior to the intervention, the partici-

pant was spending on average \$65.00 per week. Following the GMT, the participant's shopping expenditure had reduced to approximately \$54.00 and these gains were maintained at 2-month follow-up, where expenditure had further reduced to \$42.00. Significant improvements were also recorded between baseline and the postintervention measurement phases on the task used to assess generalisation (Multiple Errands Task). The results of this case provide support for the clinical utility of GMT and suggest that training benefits do generalise to non-targeted activities.

Diagnosis of Posttraumatic Stress Disorder in Children With Traumatic Brain Injury

Rian Dob,^{1,2} Justin Kenardy,¹ Nancy Pachana,² Vicki Anderson,³ Robyne Le Brocq,¹ Lynne Mckinlay,⁴ and Senem Eren³

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² School of Psychology, University of Queensland, Australia

³ Murdoch Children's Research Institute, Royal Children's Hospital, Melbourne, Australia

⁴ Royal Children's Hospital Brisbane, Australia

A large number of children sustain a traumatic brain injury (TBI) each year due to a variety of causes. It has been established that exposure to motor vehicle accidents, falls, or sports injuries may lead to the development of posttraumatic stress disorder (PTSD). Although it has been argued that TBI and associated memory loss preclude development of PTSD, diagnosis of this disorder in a person who sustained a TBI has recently become more widely accepted. This paper will discuss issues encountered in diagnosing PTSD in children with TBI. While approaching this issue from a developmental perspective, reference will be made to the more substantial adult literature in this area. The paper will systematically explore each of the three main symptom categories of reexperiencing, avoidance and hyperarousal, and how each of these symptom clusters apply in children with TBI. Theoretical issues will be illustrated with data from an ongoing longitudinal research project investigating development of posttraumatic stress symptoms in children with TBI.

CONCURRENT SESSION 2: TECHNOLOGY AND COMMUNICATION FOLLOWING BRAIN IMPAIRMENT

E-mail-Facilitated Qualitative Interviews with Traumatic Brain Injury Survivors: A New and Accessible Method

Jennifer Egan, Lesley Chenoweth, and Donna McAuliffe

The School of Social Work and Applied Human Science, The University of Queensland, Australia

The voices of traumatic brain injury (TBI) survivors are underrepresented in qualitative research and it is suggested that cognitive–linguistic impairments are a causative factor. For example, impairments affecting information processing, response formulation, recall and concentration may pose barriers in face-to-face interviewing. Qualitative enquiry using new technologies is considered expedient, economical and yet fraught with ethical considerations. This study conducted e-mail-facilitated qualitative interviews (EFQI) with 20 TBI survivors. It was an interdisciplinary collaboration of researchers with skills and experience relating to TBI survivors and/or e-mail-facilitated qualitative interviewing.

Findings indicate that this method facilitates the participation of traumatic brain injury survivors in interviews. Advantages include increased time for reflection, composing answers and a greater control of the interview setting. In addition, the data indicates that TBI survivors are capable of greater insight, reflection and humour than indicated in previous research. We conclude that new technologies may advance data collection methods for people who are challenged by traditional interview conditions. EFQI guidelines are suggested and ethical issues are explored.

Communication and Community Participation Following Severe Traumatic Brain Injury

Jacinta Douglas

School of Human Communication Sciences, La Trobe University, Australia

The ability to communicate effectively has been described as central to developing and maintaining social activities. Nevertheless, we know surprisingly little about the role that communication outcome plays in shaping social participation following traumatic brain injury (TBI). The principal aim of this project was to investigate directly the relationship between communication and community participation 2 to 4 years after injury. Twenty adults with severe traumatic brain injury (mean post-traumatic amnesia — 34.2 days) and 20 relatives completed the La Trobe Communication Questionnaire and the revised CHART. Self-report of communication by the TBI participants did not correlate significantly with social integration. However, a significant correlation was revealed between relatives' perception of communication and social integration ($p < .05$). A subset of items on the LCQ appeared to be primarily responsible for the significant relationship. The results of this study provide some insight into the nature of communication behaviours that act as a barrier to social integration for adults with severe TBI. Thus, it provides evidence that can be applied when selecting communication behaviours that need to be targeted to maximise community participation following TBI.

Communication Breakdown Following Traumatic Brain Injury and Aphasia: What Can it Tell Us?

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² *School of Language & Media, University of Newcastle, Australia*

The communication sequelae of traumatic brain injury (TBI) are significantly different from those of more focal lesions, resulting in aphasia. While discourse analyses have been used with both populations, there have been few comparative studies examining communication breakdown, which is common to both disorders, but arises from different pathophysiology. In this paper we compare three texts of a speaker with moderate–severe non-fluent agrammatic aphasia, with five texts from a person with severe TBI, with a particular focus on the analysis of communication breakdown and repair. Exchange structure analysis was used to assess the proportion of dynamic moves, which reflects the degree to which speakers worked together to maintain the flow of the interactions. While there is evidence of repair in both aphasic and TBI interactions, the nature of this process differs. The person with aphasia was more likely to self-repair or ask for assistance

with word finding difficulties, while the person with TBI was more likely to request confirmation or repetition of their partner's contribution. In addition, the communication partners of the person with TBI were more likely to use apparently unnecessary dynamic moves of checking and confirmation. Discourse analysis is critical to the management of both aphasia and cognitive communication problems following TBI. It is a tool which can establish the nature and effectiveness of different repair strategies, such as asking for clarification or encouraging self-repair. Given this information, the clinician can work with the person with communication disorder and their families in facilitating conversation, and thus engaging in more satisfying interactions as a result.

CONCURRENT SESSION 2A: COGNITIVE FUNCTIONING AND ADJUSTMENT

Relationships Among Self-Awareness, Memory, Self-Esteem and Knowledge of Traumatic Brain Injury: A Pilot Study

Amanda Lane-Brown,¹ Robyn L. Tate,¹ and Kim Ferry²

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² *Brain Injury Rehabilitation Service, Liverpool Hospital, Australia*

It is well known that severe degrees of traumatic brain injury (TBI) often result in a combination of impairments, neuropsychological ones commonly involving awareness and memory. These impairments can be a major obstacle to rehabilitation, psychosocial recovery and psychological adjustment. Beardmore and colleagues (1999) investigated whether lack of awareness of deficits after TBI in a paediatric population resulted from a lack of knowledge of the consequences of TBI and their own limitations. These investigators found a double dissociation, with increased memory ability correlating with an increased knowledge base about brain functioning and injury, while increased awareness about deficits related to decreased self-esteem. The present study aimed to replicate Beardmore et al's finding in an adult TBI population. Data are collected on 34 participants. Results suggest only partial replication of the Beardmore et al. results. Memory ability correlated with an increased knowledge base about brain functioning and injury. However, diverging from previous findings, self-awareness significantly correlated with knowledge of the consequences of TBI. Additionally, no relationship was found between self-awareness and self-esteem. Findings are discussed in the context of methodological differences between the studies, including age of participants, time post-trauma and issues concerning the measurement of self-awareness.

Awareness Typologies and Psychosocial Adjustment Following Acquired Brain Injury

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Past research highlights that individuals identified as having low self-awareness or good self-awareness following acquired brain injury (ABI) are heterogeneous groups. The objective of the present study was to identify

awareness typologies according to neuropsychological and psychological factors related to awareness deficits and to examine individuals' emotional and psychosocial adjustment at the initial assessment and 12-month follow-up. At the initial assessment 84 participants with ABI (mean time since injury = 3.9 years) were administered the Self-Awareness of Deficits Interview, Awareness Questionnaire, Symptom Expectancy Checklist, Marlowe-Crowne Social Desirability Scale, Hospital Anxiety Depression Scale and tests of executive function. Relatives completed the Sydney Psychosocial Reintegration Scale. A 12-month follow-up assessment of emotional and psychosocial adjustment was conducted. A hierarchical cluster analysis involving measures of awareness, symptom reporting, defensiveness, and error self-regulation distinguished four awareness typologies, namely, 'poor self-awareness' ($n = 12$), 'high defensiveness' ($n = 13$), 'high symptom reporting' ($n = 15$) and 'good self-awareness' ($n = 44$). Between-group comparisons indicated that, overall, the poor self-awareness and high symptom reporting typologies experienced poorer emotional and psychosocial adjustment than the high defensiveness and good self-awareness typologies. The findings support the existence of different awareness typologies related to neuropsychological and psychological factors and emphasise the need to tailor rehabilitation interventions accordingly.

Cognitive Functioning and Outcome Ten Years Following Traumatic Brain Injury

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The impact of traumatic brain injury (TBI) in the short-term has been well researched but relatively few studies have examined in detail long-term outcomes following TBI. The aim of this study was to examine cognitive function, measured both neuropsychologically and by self-report, and outcome 10 years postinjury in a group of 60 individuals with moderate-severe TBI, as compared with controls ($n = 43$) of similar age, gender and education. Outcome was assessed using the Glasgow Outcome Scale-Extended (GOSE). Measures of cognitive functioning included Digit-Symbol Coding, Symbol-Digit Modalities Test — Oral, Trail-Making Test, Hayling Sentence Completion Test, Digit Span, Rey AVLT, Doors and People Test, Porteus Mazes and the Sustained Attention to Response Task. Self-reported cognitive deficits were captured with the Neurobehavioral Functioning Inventory (NFI). Outcome on the GOSE ranged from upper good recovery (31.7%) to lower severe disability (1.7%). The TBI group demonstrated significant cognitive impairment relative to controls on measures of attention, processing speed, memory and executive function. There were significant correlations between performance on cognitive measures and outcome. Porteus Mazes and Digit-Symbol Coding were significant predictors of outcome. TBI self-reported cognitive deficits were weakly correlated with performances on cognitive testing and outcome. Stronger correlations were found between TBI self-reported cognitive deficits and emotional status. A significant proportion of this sample with moderate-severe TBI showed cognitive impairments and associated residual handicap ten years post-injury. Objective cognitive measures were more strongly associated with outcome than self-reported cognitive changes. Further studies will focus on long-term psychosocial and emotional functioning and their relationship with outcome and cognitive functioning

Does Cognitive Function Change or Just Reduce in Efficiency Following Mild Traumatic Brain Injury?

Brooke K. Dougan and Gina M. Geffen

School of Psychology, The University of Queensland, Australia

This study analysed the factor structure of neuropsychological function in patients suffering acute mild traumatic brain injury (mTBI), compared with that of matched orthopaedic injury patients and uninjured controls. A valid and reliable neuropsychological screen for mTBI, the Rapid Screen of Concussion, as well as the Digit Symbol-Coding Test, Hopkins Verbal Learning Test, Depression Anxiety Stress scale and ratings of symptom severity were administered in a hospital emergency department within 24 hours of injury to 190 patients with mTBI and 156 control participants. To determine the factor structure of cognitive function in the presence or absence of a mild brain injury, two factor analyses were performed on 15 variables using principal components extraction with varimax rotation. The number of factors to be rotated was determined on the basis of initial eigenvalues >1 . The factor analyses indicated that a 5-factor solution (information processing speed; attention; verbal learning and memory; orientation; post-concussive symptoms) was most appropriate for non-mTBI participants, accounting for 76.8% of the variance; while only a 4-factor solution (information processing speed; attention; orientation + post-concussive symptoms; verbal learning and memory) was required to account for 72.11% of the variance in mTBI participants' test performance. In addition, the relative importance of factors, pattern of factor loadings and factor complexity differed between mTBI and non-mTBI participants. These findings suggest that mTBI results in both a functional change relative to specific cognitive domains and a general reduction in cognitive processing efficiency. The differential contribution of post-concussive symptoms will be considered.

CONCURRENT SESSION 3: PSYCHOSOCIAL CHALLENGES AND ADJUSTMENT AFTER TBI

Transition of Younger People with Acquired Brain Injury from Residential Aged Care to Community Living: Anticipated and Actual Outcomes

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It is estimated that there are over 1000 people under 60 years of age with Acquired brain injury (ABI) living in residential aged care in Australia (Australian Institute of Health and Welfare, 2005). Recent research has shown that aged care facilities do not support the active participation of younger residents in social, recreational and community activities (Winkler, Farnworth & Sloan, 2005). Over the past decade there has been a gradual increase in the number and range of alternate housing and support models developed for this population. Although there is general agreement that younger people should not reside in nursing homes (Council of Australian Government, 3 June 2005), there has been limited research to examine the outcomes of transition from aged care to community living (Headway Victoria, 2003). This paper will present the results of a qualitative study that

interviewed people with ABI (and their significant others) who had recently moved from residential aged care to the community. The study aimed to answer the following questions: What were the anticipated outcomes of transition? What were the key outcomes of transition? What are the crucial factors in a supported living environment that facilitate participation? The themes derived from this study provide a basis for the selection and/or development of quantitative outcome measures of transition from aged care to community living. This study also gives clear direction for the development of housing and support solutions that empower people with ABI to participate in the community.

Forced Choices: A NSW Study Into the Accommodation of Young People With High Support Needs After TBI

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There is a dearth of accommodation options in NSW for young people with high support needs after traumatic brain injury (TBI). When going home from hospital is not an option, an aged care residential-care facility (nursing home) is generally the only alternative. The neglect of service provision in this area raises fundamental issues of human rights and social justice which profoundly impacts upon rehabilitation outcomes. A study was conducted to examine the accommodation outcomes of people with high support needs after TBI. The aim being to identify key factors resulting in a discharge to a nursing home, evaluate current living circumstances and identify options for achieving community based accommodation. A sample of 54 people with high support needs after TBI was identified. A data collection protocol was devised and applied to 39 respondents. A series of interviews was conducted with people with TBI, key family members and service providers. The study found that the central factor in determining a person's discharge destination after TBI was willingness of the family to undertake the role of providing for the person's care and support. There were people being cared for in community settings who had equivalent levels of disability to those living in nursing homes. Nursing homes were not identified as providing an acceptable accommodation option for people with TBI. The reality of a nursing home as the only accommodation choice available forced some relatives to choose to take their family member home. The findings from the study highlight the need for a state-wide program to develop and fund service initiatives targeting improving the lives and accommodation options for people living with the long term consequences of TBI.

Vocational Outcomes After Traumatic Brain Injury: Comparing People Who Return to Pre-Injury Employment to People Seeking New Employment

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Return to work is a key measure of recovery from traumatic brain injury (TBI). However, people who return to work have been traditionally treated as one group. To test this, the outcomes from the three vocational streams delivered by Head2Work are being analysed, namely (1) return to pre-injury employment, (2) job seeking, and (3) work retraining. The current report compares the characteristics of people who return to their pre-injury

employment with those who undertook job seeking. The overall study sample comprised 81 consecutive admissions to Head2Work over a 3-year period (2002–2004), of whom 30 aimed to return to their pre-injury employment, and 17 underwent a process of job seeking. A protocol was devised and the participant files reviewed to extract data on demographic, injury, program intervention and outcomes at case closure. There were no differences between the two groups in respect of pre-injury psychosocial status, weekly number of hours worked, years of education, age at injury, severity of injury (mean 22 days posttraumatic amnesia) or compensation status. However, the job-seeking group had worked for a much shorter periods in their employment prior to the injury (5 months vs. 25 months). Post injury, a significantly higher proportion of people in the job-seeking group experienced emotional/psychiatric disturbance. Furthermore, they commenced their vocational program much later than the group returning to their pre-injury employment (4 months vs. 17 months). Despite this, at the point of case closure, both groups achieved similar employment outcomes in terms of productivity and number of hours worked. This study suggests that people seeking new employment can achieve similar results to those returning to their pre-injury employer. However, the pathways by which this is achieved required different program approaches.

Subjective Quality of Life in the First Year Following Traumatic Brain Injury

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Quality of life has become an important indicator of adjustment to injury and rehabilitation outcome. However, little research has examined subjective measures of quality of life (SQOL) within the traumatic brain injury (TBI) population. This study aimed to validate a commonly used SQOL measure, Frisch's (1994) Quality of Life Inventory (QOLI) within an Australian sample of adults with TBI. The QOLI is a theory-based measure of quality of life, containing sixteen domains of psychosocial functioning such as health, work, money, family, and home. This prospective outcome research was conducted in conjunction with a population-based TBI outcome study conducted by the Neurotrauma Register of Tasmania. The present study admitted 350 people who had sustained TBI. Respondents estimated their pre-injury quality of life on the QOLI as soon as practical following injury, and then at 1, 3, 6 and 12 months following injury. Analysis compared normative distributions of this TBI sample with the QOLI's US-based norms, identified a factor structure for the measure, and tracked outcome across these time-points. Results showed this sample of Tasmanians rated differences in their pre-injury SQOL to the US normative sample. Factor analysis revealed several factors within the QOLI that were comparable with factor solutions conducted in other clinical populations, and facilitated closer investigation of trends in SQOL outcome. This study provides information supporting the use of the QOLI within the Australian TBI population, and will be of interest to researchers and clinicians engaged in tracking recovery, or restoring the quality of life of people suffering TBI.

Variation in Family Life Following the Acquired Brain Injury of an Adolescent Child: Implications for Family-Centred Practice

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The purpose of this study was to explore family life after the acquired brain injury of an adolescent child, in particular how parental caregivers shape everyday family life during the first two years post injury to accommodate the disrupted development of their adolescent. Parents from 12 families where an adolescent aged 15 to 19 years had sustained a severe brain injury were interviewed using a narrative approach. Up to five interviews took place with each family over the first 2 years post injury to capture the process of adaptation. Paradigmatic analysis of narrative data was conducted using constant comparative methods. There was an initial crisis period common to all families. Parents organised daily life to spend time at the hospital focussing on the survival of the adolescent. As recovery took place and the adolescent returned home, parents assessed how the injury had altered their adolescent's development and how family life would need to change to accommodate the altered child. Three divergent ways of living emerged. Some parents constructed a rehabilitative life. These parents worked hard to rehabilitate their child to facilitate the best recovery possible, altering family routines to concentrate on both formal and home-based rehabilitation. Others constructed a daily routine that searched for a settled life. These families faced many disruptions due to their adolescents' behavioural changes post injury and parents aimed to achieve a stable family routine. Another group of parents constructed a cautious life. These parents' aimed to ensure their child remained safe from harm during the recovery period. The adolescents in these families had good recoveries and were able to gradually resume their previous life. The findings of this study reveal the variation in families' adaptive processes and thus the need for family-centred service provision to meet the varying needs of families during this time.

CONCURRENT SESSION 4: INNOVATIONS IN DIAGNOSTIC AND ASSESSMENT APPROACHES

Development and Reliability of Neuropsychological Assessment by Videoconferencing

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With the advent of videoconferencing technology specialist services such as neuropsychological assessment can be provided to remote areas. However, there are no guidelines for administration of neuropsychological tests under videoconferencing conditions, and the reliability neuropsychological assessment using videoconferencing for patients with suspected cognitive impairments has not been evaluated. A repeated measures within-subjects study was designed to develop a set of procedures for videoconferencing, and to evaluate the reliability of neuropsychological testing by videoconferencing. Twenty-two subjects (mean age = 65 years; M = 11, F = 11) with a range of cognitive impairments, were assessed using parallel forms of the Repeatable

Battery for the Assessment of Neuropsychological Status (RBANS; Randolph, 1998) via two modes: (1) face-to-face and (2) videoconferencing from a remote site, with the mode and assessor being randomised. The Total Scale Index scores on the RBANS for the face-to-face and videoconferencing modalities of administrations were significantly correlated ($r = .86$; $p < .01$) and this association was comparable to the test-retest correlation reported in the RBANS manual for the two parallel forms ($r = .82$). Correlations between the five subtest Index scores for the two assessment modalities ranged from $r = .23$ to $.70$, and indicated poor reliability for two of the indices. The study generated a package of videoconferencing administration procedures, and indicated that the overall assessment of patients by videoconferencing demonstrated satisfactory reliability on a standardised assessment tool. Variation in the correlations between specific subtest index scores will be discussed in relation to the characteristics of this sample, how cognitive impairment may impact upon test-retest reliability, and on the videoconferencing mode of assessment.

Development of the Sydney Psychosocial Reintegration Scale: An Update on the Final Version, Normative and Reference Data

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The Sydney Psychosocial Reintegration Scale (SPRS) is a measure of community participation, originally developed for people with traumatic brain injury (TBI). It samples three domains (occupational activity, interpersonal relationships, and living skills). There are two forms of the SPRS, each with 12 comparable items. Form A uses the premorbid functioning of the injured person as the comparison standard, measuring from the perspective of 'change since the injury'. Form B uses the general community as the comparison standard, measuring 'current competency'. Each form uses a 7-point rating scale from 0 (extreme change/very poor for Forms A/B respectively) to 6 (no change/very good for Forms A/B respectively). Each form has three versions (self, informant and clinician). Psychometric properties of the two forms of the SPRS have been studied extensively in independent samples. Both forms show high internal consistency, interrater reliability and stability. Responsiveness, concurrent and construct validity have also been demonstrated for Form A. The present paper describes recent developments of the SPRS, which have focused on improving user characteristics. The SPRS is now in a computerised format and is more streamlined. Demonstrations are provided of the facility of built-in charts, which enables comparison of an individual client's data with reference data from 540 people with TBI and 109 healthy volunteers. The SPRS has demonstrated usefulness in research studies and the more recent developments enhance its use as a clinical tool, being brief, user-friendly and having immediate access to comparison data.

When Does Posttraumatic Amnesia End?

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In spite of the increasing number of tests of posttraumatic amnesia (PTA), few provide validation data to define the end of PTA. This study provides external validation for a criterion to signify the end of PTA on two tests, the Modified Oxford PTA Scale (MOPTAS) and Westmead PTA Scale (WPTAS). Eighty-two patients with very severe traumatic brain injury (TBI) and in the early stages of PTA were administered a short battery of tests on three occasions according to their score on the MOPTAS/WPTAS: the early stage of PTA, scoring 7/12, (Time 1); towards the end of PTA when the maximum score (12/12) was first obtained (Time 2); and at the traditional criterion for emergence from PTA on these tests, scoring 12/12 on three consecutive days (Time 3). The validation battery included screening measures of cognitive function, tests of attention, processing speed, verbal and nonverbal learning and memory. The MOPTAS and WPTAS samples were combined because there were no group differences in PTA duration or on the validation measures at any test occasion. Significant improvements occurred on all five validation measures between Time 1 and Time 2, but on only two of five measures between Time 2 and Time 3. At Time 2, when patients first scored 12/12 on the MOPTAS/WPTAS, 11.5% scored in the borderline range on the GOAT, however, no patient scored in the defective range. The results suggest that, in all likelihood, patients in PTA for greater than 4 weeks have emerged from PTA when they first score 12/12 on the MOPTAS/WPTAS and that this criterion could replace the traditional criterion.

Defining Emergence From the Minimally Conscious State

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The early stages of recovery from traumatic brain injury (TBI) are characterised by various states of altered consciousness. Operational definitions have been applied successfully to some of these (viz. coma, vegetative state and posttraumatic amnesia), but the terminology surrounding the minimally conscious state (MCS) has had a more recent history. Although clear diagnostic guidelines for entry into the MCS have been established, criteria for emergence from the MCS are less clear. This study examined the natural history of recovery from the MCS in nine patients who had detailed, prospective evaluations during the course of the MCS. Five behaviours (comprehension of simple commands, manipulation of objects, gestural or verbal 'yes/no' response, intelligible verbalisations and stereotyped nonreflexive movements) were monitored with the Western Neurosensory Stimulation Profile throughout the course of each patient's recovery. In all cases stereotyped (nonreflexive) movement was the first behaviour to resolve, yet by itself it was never sufficient to indicate emergence from the MCS. Two of the nine patients demonstrated consistent object manipulation prior to all three elements of functional communication. Conversely, in two patients all three components of

functional communication emerged before object manipulation. In the remaining five patients object manipulation occurred along with components of functional communication. During the course of data collection issues were raised regarding the artificial prolongation of recorded MCS and the differentiation between this altered state of consciousness and PTA. The data are discussed within the context of the work of Giacino et al. (2002) and the development of their scale to measure duration of the MCS. These data support the theory that functional communication and object manipulation are the two key indicators of emergence from MCS.

Reliability of the Care and Needs Scale (CANS) for Assessing Support Needs After Traumatic Brain Injury

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Currently there is a lack of scales that adequately measure the type and extent of support needs of people with traumatic brain injury (TBI). The Care and Needs Scale (CANS) (Tate, 2004) is an 8-point categorical assessment designed to gauge support needs in a range of areas of everyday functioning. It has been validated on a group of people with TBI who were 23 years post trauma. The aim of this paper is to report on the reliability of the CANS. Reliability of the CANS was examined in a sample of 30 people who sustained TBI and were community clients of the Liverpool Hospital Brain Injury Rehabilitation Service. Interrater reliability was assessed by comparing CANS ratings that were completed by two occupational therapists (OT) and a case manager independently. CANS ratings on the same clients were also made 1 week later in order to investigate stability. Reliability was further investigated in 40 people from the community caseload of the Brain Injury Rehabilitation Service of the Royal Rehabilitation Centre Sydney. CANS ratings were completed by three different informants: clinician, client, and relative. Clinician ratings on the CANS showed excellent interrater reliability both within and across disciplines: $r_s = .97$ between two OTs and $r_s = .95$ and $.97$ between OT and case manager. In addition, the stability of the CANS was also excellent with a correlation of $r_s = .99$ found for ratings completed at baseline and one week later. Clinician, client, and relative CANS ratings of the same client showed differential agreement. Correlations between ratings given by clinician and relative, as well as between client and relative, were significant ($r_s = .58$ and $r_s = .41$ respectively). In contrast, CANS ratings completed by the clinician and client were not significantly related ($r_s = .31$). These results demonstrate that the CANS has high interrater and test-retest reliability. Reliability coefficients of proxy ratings were more variable. Further studies on the psychometric properties (concurrent, construct and predictive validity) of this instrument are currently being conducted.

CONCURRENT SESSION 4A: SOCIAL SKILLS IMPAIRMENTS AFTER ACQUIRED BRAIN INJURY IN CHILDHOOD: IMPLICATIONS FOR TREATMENT

The Impact of Head Injury Severity on Long-Term Social Outcome Following Traumatic Brain Injury in Children

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Traumatic brain injury (TBI) is a common childhood condition and may have a profound and long-term impact on cognitive, psychological and social functioning. Relatively few studies have focused specifically on the social outcomes associated with childhood TBI and have relied largely on parent ratings of social functioning. The aim of the current study was to investigate the impact of head injury severity on long-term social outcome and examine child and parent perceptions of social functioning. A total of 30 adolescents and young adults who sustained a closed head between the ages of 8 to 12 years were examined 7 to 10 years post injury, ranging between 16 to 22 years of age at the time of assessment. Measures of social functioning included parent and adult versions of the Sydney Psychosocial Reintegration Scale (SPRS), Social Skills Rating System (SSRS) and the Adaptive Behaviour Assessment System (ABAS). Findings indicated that adolescents and young adults who suffered a moderate or severe TBI during childhood displayed poor social outcome in comparison to those that suffered a mild TBI. Child and parent perceptions of social outcome will also be discussed.

Social Problem-Solving Skills as a Mediator Between Executive Function and Long-Term Social Outcome Following Traumatic Brain Injury in Children

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There is little agreement within the literature regarding the relationship between executive function and social outcome following traumatic brain injury (TBI) in children. It has been suggested that the inconsistent findings may be due to the lack of a proposed mechanism through which this relationship exists. Yeates and colleagues (2004) propose a possible model in which the maturity of social problem solving skills mediates the relationship between executive function and social outcome. The current study aimed to explore the relationship between executive function and social outcome, and determine whether social problem solving mediated this relationship. The long-term outcome of executive functioning and social functioning following the transition into adulthood, and their relationship with injury severity was also examined. The sample consisted of 36 adolescents and young adults who sustained a closed head injury between 8 to 12 years of age. They ranged between 16 to 22 years of age, at a time of 7 to 10 years post injury. Findings demonstrated that adolescents and young adults who suffered moderate and severe TBI during childhood displayed executive dysfunction and poor social outcome compared to those that suffered mild TBI. Further, the maturity of social problem solving skills was found to mediate the relationship between executive function and social outcome in this group.

Treating Emotion Perception Deficits in Traumatic Brain Injury

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The presence of significant emotion perception deficits in a large proportion of individuals with severe traumatic brain injury (TBI) has been the focus of numerous studies over the past few years. Much less attention has been directed at developing appropriate techniques for remediating these deficits in a clinical setting. The present research comprises the second of two treatment studies, the first of which was presented at ASSBI 2004. The second study aimed to examine the effectiveness of two strategies, errorless learning and self-instruction training, for the specific purpose of remediating deficits in interpreting emotional cues. Both of these techniques have been shown to be effective with TBI clients for retraining in other cognitive domains. Participants were 14 outpatient volunteers (13 male, 1 female) with chronic TBI symptoms, who had been referred by staff members of a brain injury rehabilitation unit in the Sydney area. Following preliminary assessment on a range of emotion perception and psychosocial measures, they were randomly allocated to errorless learning, self-instruction training and waitlist groups. Treatment comprised 25 hours (across 8 weeks) of a specifically designed program, which had been adapted so as to incorporate either errorless learning or self-instruction training, to the exclusion of the other technique. The main focus of the program was on mastery of basic emotion discrimination skills although treatment also encompassed the use of these skills in making social inferences such as sarcasm and lying in order to be kind. Results indicated that both treatment groups improved significantly relative to controls in their ability to discriminate between basic emotional stimuli (i.e., photographs). When results from the two treatment groups were collapsed together and analysed in comparison to waitlist group results, evidence was also found that treatment recipients significantly improved on in their ability to make social inferences (The Awareness of Social Inference Test [TASIT], Part 2). The implications of these findings are discussed with reference to the literature on emotion perception remediation.

Relationship Between Attention and Social Functioning Following Childhood Stroke

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Attention deficits and social problems are commonly reported following acquired brain injury in childhood but the specific relationship between these skills is poorly understood. Recent neuroimaging and lesion studies implicate an overlap in cerebral substrates required for both adequate attentional function and effective social skills and suggests that these skills are strongly interdependent. To investigate this notion, we examined social functioning and attentional skills in 12 children with focal brain pathology following childhood stroke. Results suggest a strong link between attention deficits and social problems, particularly for behavioural

components of attention, such as inhibition, adaptive behaviour and emotional control. Further, specific attentional processes were found to correlate with different behavioural problems (e.g., selective attention deficits were associated with increased conduct problems and peer problems while divided attention deficits were strongly correlated with problems behaviours). These findings support previous research of distinct but integrated cerebral networks for both attentional function and social skills. Clinically, results suggest that specific attentional processes, in particular, selective, sustained and divided attention may play a critical role in social function in childhood and has implications for treatment and management of children following childhood brain injury.

Assessment of Social Cognitive Functioning after Traumatic Brain Injury: Can it Benefit the Treatment of Social Skills Impairments?

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The treatment of social skills impairments after traumatic brain injury (TBI) generally uses cognitive-behavioural therapy paradigms. However, little empirical research has addressed the specific cognitive impairments characteristic of TBI patients. Without this knowledge, current CBT practices are potentially based on inaccurate cognitive schemas or are somewhat unstructured in their approach. A model of social information processing offers an alternative basis from which to describe cognitive impairments. Cognitive functioning based on this model has been an integral component in the treatment of aggressive and anxious children and has strong applications for TBI patients. However, inappropriate measurement has been a major factor in the inaccurate assessment of social cognitive functioning after TBI. Thus, we have developed a measure of social-cognitive functioning, Brain Quest (BQ), that is suitable for use with TBI patients. Thirty adolescent male participants with TBI completed BQ and a traditionally used measure. Importantly, administration of BQ was significantly faster than traditional measures and participants reported it as being more engaging and believable. TBI patients were significantly worse than controls in response generation and evaluation. We conclude that a) BQ is a more accurate measure of social cognitive functioning in TBI patients and b) TBI patients have specific social cognitive deficits that can be addressed in treatment. This study makes an important contribution to both the measurement of social cognitive functioning and the development of appropriate treatment programs for the social skills impairments commonly reported after TBI.

CONCURRENT SESSION 5: ENHANCING PSYCHOSOCIAL OUTCOMES

Principles and Outcomes of the Community Approach to Participation

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Outcome studies demonstrate that, following severe acquired brain injury (ABI), people are disadvantaged in their opportunities for participation in meaningful occupation and community integration. The Community Approach to Participation (CAP) (Sloan, Winkler, & Callaway, 2004) is an individualised and collaborative model of community-based rehabilitation practice which is based on the knowledge that people can increase their level of community participation despite complex, persisting impairments. This paper will describe the principles of the CAP and then present outcome data of a sample of over 100 subjects recruited from two private practices specialising in community-based management of people with ABI. All participants had long term and complex cognitive-behavioural impairments and had received CAP occupational therapy services for over 2 years. The outcome measures utilized in the study included the Functional Independence Measure, Community Integration Questionnaire (Willer, Rosenthal, Kreutzer, Gordon, & Rempel, 1993), Role Checklist (adapted from Barris, Oakley & Kielhofner, 1988), Care and Needs Scale (Tate, 2004), and hours of paid attendant care and unpaid support. The results of this study provide evidence that the contextualised slow-stream rehabilitation provided resulted in overall positive change in levels of participation, function, support needs and long term cost of care.

Allied Health Professionals' Perspectives of Factors Contributing to Achievement of Patient Outcomes when Providing Rehabilitation in Home and Community Settings: A Qualitative Investigation

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The revision of the International Classification of Functioning (ICF) by the World Health Organization (WHO) recognised the impact of environmental factors on a person's participation and functioning. Internationally, neurological rehabilitation services are increasingly being delivered in home and community settings and the efficacy of this is being investigated. Given this shift in service delivery, models of service delivery and treatment approaches which incorporate environmental factors into community based rehabilitation following acquired brain injury (ABI) require investigation to achieve optimum outcomes for people with ABI. The study aim was to explore the factors contributing to achievement of outcomes for people with ABI living in the community with a focus on the influence of, access to and amenability of environmental factors in a community rehabilitation setting. This investigation used semistructured interviews of nine Australian and three British rehabilitation practitioners with a mean of 5.5 years experience (range = 1.5–10) in ABI specific community based rehabilitation. Verbatim transcripts of interviews were coded and thematically analysed to identify salient themes and patterns across interviews

using N-vivo qualitative data analysis software. Interviewees completed a follow-up questionnaire and a broader focus group of ABI specific service providers ($n = 35$) was conducted to further verify the emerging interview themes. Emerging themes included the importance of environmental compensation and task adaptation to optimise function, the benefits of a 'real life' setting in terms of optimal assessment and goal setting, realistic strategy training, situational feedback to enhance self awareness and a relaxed, open atmosphere as well as access to and inclusion of sustainable supports such as family. Other factors identified as having a positive influence on outcomes included collaboration with others in the community to achieve goals, development of a therapeutic relationship, client-centred goal setting, provision of ongoing education, self awareness of deficits, motivation and the absence of behavioural difficulties. These findings have contributed to the development of an environment-focused, goal-based rehabilitation program to be clinically trialed. This intervention program will be outlined.

Evaluation of an Intervention Based on the ICF 'Environment' Dimension for Enhancing the Wellbeing and Psychosocial Outcomes of Adults in Outpatient Brain Injury Rehabilitation

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The World Health Organisation endorsed the International Classification of Functioning Disability and Health (ICF) in 2001. The ICF proposes an interactive model of disability, where the environment either facilitates or inhibits all aspects of a person's function and participation. This study aimed to develop and evaluate an intervention based on the ICF environmental dimension for rehabilitation outpatients with acquired brain injury (ABI). In-depth interviews with 18 day hospital patients with ABI and their significant others, and round-table discussions with day hospital staff, explored the role of environmental factors in brain injury rehabilitation. Based on these qualitative data, a 6-week environment-focused intervention entitled the PEER (Personal Environments Enhancing Rehabilitation) group was developed. The intervention was conducted with 18 participants (3 groups of 6) with standardised outcome measures (CHIEF, HADS, SPRS, MOS-SS, BICRO) and semistructured interviews administered pre-post intervention and at 1-month follow-up. Outcomes of the intervention group were compared with data collected from historical controls using 2×2 ANOVAs. Qualitative data was analysed thematically using N-vivo. Significant interaction effects (group \times time) were found for two measures (SPRS score and HADS depression score) in the direction of greater improvements for the intervention group than for controls. Qualitative comments included the benefits of sharing experiences with peers, goal setting, group content and processes, and comparisons with others with ABI. An environment-focused intervention was useful in improving outcomes for patients in terms of better self-reported community integration and less depression.

CONCURRENT SESSION 6: PHYSICAL TREATMENTS AND QUALITY OF LIFE

Factors That Influence Compliance With a Structured Exercise Program in Traumatic Brain InjuryLeanne Hassett,¹ Robyn Tate,² Anne Moseley,³ and Lauren Gillett¹¹ *Brain Injury Rehabilitation Unit, Liverpool Hospital, Australia*² *Rehabilitation Studies Unit, University of Sydney, Australia*³ *School of Physiotherapy, University of Sydney, Australia*

People with disabilities from traumatic brain injury (TBI) and other health conditions are significantly less physically active than the able-bodied population. This sedentary lifestyle puts them at risk of developing serious health problems seen in people who are physically inactive, including coronary heart disease and type 2 diabetes. We aimed to investigate potential barriers and facilitators that may influence participation in regular exercise. Sixty people who had sustained a very severe or extremely severe TBI who could walk at a speed exceeding 1m/s and were hospitalised for at least 1 month were randomised to one of two exercise programs on discharge from inpatient rehabilitation. One program involved attending a gym and exercising under the supervision of a personal trainer. The other involved completing a home exercise program that included detailed written instructions and photographs, but no supervision. The exercise compliance rates were examined between the two groups and within the home-based exercise group. Participants in the home-based group were split into compliant (>70% adherence to program) and non-compliant subgroups. Factors that could influence compliance rates were examined within the International Classification of Functioning, Disability and Health (ICF) framework. The supervised gym-based exercise group had a higher average compliance rate than the unsupervised home-based exercise group, demonstrating that providing a highly structured program in a facilitative environment increases exercise behaviour. Factors that influence compliance within the home-based group will be examined and discussed in this paper.

A Randomised Trial of Handsplinting to Prevent Contracture Following Acquired Brain ImpairmentNatasha Lannin,¹ Anne Cusick,² Annie McCluskey,² and Robert Herbert³¹ *Rehabilitation Studies Unit, University of Sydney, Australia*² *University of Western Sydney, Australia*³ *University of Sydney, Australia*

This study aimed to determine if wearing a hand splint every night for four weeks reduced the risk of developing contracture in the wrist and long-finger flexor muscles after stroke. Randomised, assessor blinded trial with concealed allocation conducted in nine rehabilitation/stroke units in Sydney. Sixty-three adults within 8 weeks of stroke were randomly assigned to one of three groups: Group A wore a splint overnight which positioned the wrist in maximal extension ($n = 21$), Group B wore a splint overnight which positioned the wrist in neutral ($n = 21$), and Group C was a control group ($n = 21$). Subjects in experimental and control groups participated in routine motor training therapy but did not receive prolonged stretches to the wrist or fingers. Primary outcome was torque-controlled range of wrist extension with fingers extended, secondary outcomes were functional upper limb use, spasticity and self-rated

disability. There were no statistically or clinically significant differences in contracture rate between the three study groups; splinting the wrist in a functional position (Group A) increased wrist extension by a mean of 1.5° (95% CI -5.7° to 8.7°) and splinting the wrist in maximum extension (Group B) reduced wrist extension by a mean of 2.5° (95% CI -9.6° to 4.6°) compared to the control condition (Groups C) at 4 weeks. There was also no significant difference between groups on secondary outcomes. These findings are of clinical relevance for therapists working in acute rehabilitation following stroke, many of whom may apply this intervention routinely to this client group.

Establishing Quality of Life in the Severely Impaired Client: A Single Case Study

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This paper presents a model of integrated care and a service delivery method of establishing errorless learning for a client in a regional area. We will present a case of a 56-year-old man, who had sustained an anoxic brain injury at age 43. He was diagnosed by multiple physicians as being in a vegetative state throughout a 13-year period. He spent several years in a nursing home without therapy input. During this period he developed contractures and increasingly distressed vocalisations. Initial assessments were undertaken using the Disability Rating Scale (DRS), Wessex Head Injury Matrix (WHIM) and readministered following a 12-month period of intervention. A series of specific movement programs were developed that targeted all manual handling, personal care routines, oral care and specific movement patterns to establish comfortable positioning in bed and wheelchair. Consistent verbal input to enable preparation for movement and opportunities for visual scanning were integrated. To establish errorless learning for carers and client, a series of videos were developed. By working with a manual and video, carers were able to follow each movement session consistently and ensure steps were followed in exact sequence. Therapist supervision was minimal. Post intervention: Disability Rating Scale improved from vegetative (DRS 23) to severe disability (DRS 17) range and Wessex Head Injury Matrix scores improved from 6/62 to 19/62. Effective intervention for the severely disabled client can be achieved using training support aids to ensure a consistent procedural learning process.

CONCURRENT SESSION 7: APPROACHES TO TREATMENT ACROSS THE REHABILITATION CONTINUUM

Resident Perceptions of a Transitional Living Unit Program

Louise Diffley and Jill Hummell

Westmead Brain Injury Rehabilitation Service, Australia

The Transitional Living Unit (TLU), Westmead Brain Injury Rehabilitation Service, assists residents to achieve their goals relevant to the domestic, community and social living skills required to return to community-based living. Integral aspects of the program are its 24-hour-per-day, 6-days-per-week therapeutic environment, collaborative goal setting, individ-

ual and group therapy, and its integrated multidisciplinary approach. A quality management project was undertaken to gather information on residents' perceptions of the TLU program. The TLU occupational therapist/coordinator used semistructured interviews with 14 residents about their expectations of the TLU program on admission and experiences on discharge. A content analysis of residents' comments was completed. The relationships between individual resident comments, their program goals and level of self-awareness were then explored. On admission, residents commonly identified their expectations of the TLU program as assisting them to return to live in the community. Some residents expressed uncertainty about the program's purpose. On discharge, the majority of residents provided positive feedback about the varied aspects of the TLU program. Preliminary findings of the relationship between resident comments, goals and self-awareness suggested that while residents had varying levels of self-awareness and perceptions of the purpose of the TLU, the majority achieved their goals. By incorporating a quality management approach into TLU admission and discharge processes, valuable resident feedback about the TLU program was gathered, interpreted and used to refine the program.

Transitional Living Program Evaluation Across the NSW Brain Injury Rehabilitation Program: A Pilot Study

Kate Hopman¹, Grahame Simpson,² and TLP Coordinators (Cheryl Duncan – Albury, Barbara Stretles – Liverpool, Bonnie Conway and Jeremy Gilchrist – Goulburn, Kathy McCosker – Newcastle, Lena Karlsson – Ryde, Louise Diffley – Westmead, Lyndall Ross – Bathurst, Marg Macpherson – Tamworth)

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There are eight Transitional Living Programs (TLP) within the NSW Brain Injury Rehabilitation Program, providing intensive post-acute rehabilitation programs within a decentralised service structure. Few studies have examined the efficacy of TLPs as these programs are characterised by small client numbers, varying program lengths, differing rehabilitation objectives and different service delivery models. To address this issue, a state-wide, multicentre evaluation project has been initiated within the NSW BIRP. A prospective, longitudinal, pre- and post-study design was implemented across the BIRP TLP network. Data was collected for consecutive admissions to all NSW TLPs from January to December 2004 ($N = 89$). Analysis of sample characteristics identified no significant differences across gender, age and injury severity (as measured by post traumatic amnesia) for the individual units. There was, however, significant differences in the time between injury and admission to metro and regional programs. Mean length of stay was 40 days (range = 2–193, $SD = 37$), suggesting that the NSW units generally provide short, intensive programs. Outcomes were measured with the Mayo Portland Adaptability Inventory version 4 (MPAI-4; Malec et al. 2003) and the Functional Autonomy Measurement System (SMAF; Hebert et al. 1988). Scores on all three subscales of the MPAI-4, and 7 of the 8 SMAF items demonstrated significant improvements from TLP admission to discharge. The results indicated that people admitted to NSW TLPs made measurable functional gains, even over brief admissions. These results provide preliminary evidence for the efficacy of TLPs. Further research is required to identify whether similar gains can be made by means of alternative post acute rehabilitation models.

Do Posttraumatic Amnesia and Dysarthria Treatment Mix? Preliminary Findings

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Dysarthria is widely recognised as a persistent motor sequelae of severe traumatic brain injury (TBI); present in one-third of TBI individuals. Intervention for post-TBI dysarthria has been shown to be efficacious; however, at present there is limited evidence on how early is too early to begin treatment. The aims of the study were to determine the suitability for, and benefits gained from commencing dysarthria treatment during post-traumatic amnesia (PTA) following severe TBI. This preliminary study involved three case analyses of individuals who commenced motor-based treatment for post-TBI dysarthria during PTA. Perceptual and acoustic measures of motor speech ability were taken immediately pre-treatment and post-emergence from PTA, with the treatment beginning once individuals received a PTA score of 10 on the Westmead PTA Scale (Shores et al., 1986). A checklist of neurobehavioural sequelae of PTA was rated during each therapy session to document behavioural influences on sessions. The results from the case analyses revealed that certain behaviours affected the length and quality of therapy sessions but did not preclude participation in motor-based speech therapy. In all cases improvements at the physiological level of speech occurred, with improved functional outcomes for two of the cases. These preliminary case analyses suggest that it is beneficial to begin motor-based speech therapy for post-TBI during PTA, however, behavioural considerations may influence the suitability of some individuals for treatment. There is a need for continued research into the timing of treatment for post-TBI dysarthria, and overall benefits gained from early treatment onset.

Treating Social Skills Deficits Following Traumatic Brain Injury: Preliminary Results From a Randomised Controlled Trial

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Social skills deficits are a major target for rehabilitation in adults with severe traumatic brain injury as psychosocial difficulties are universally identified as the major stumbling block to successful reintegration into the community. Despite this there have been few empirical evaluations of the effectiveness of social skills remediation in this group. In this study we report the preliminary results of a randomised controlled trial to determine the effectiveness of social skills training compared to a social group (placebo) condition and wait list control. Forty-two participants from three major metropolitan brain injury units were recruited for this study. All participants had experienced severe traumatic brain injuries (mean duration of PTA was 120 days) and were well past the acute phase of recovery (mean time post injury was 7 years). Thirteen were allocated to treatment, 14 to social group and 14 to waitlist control condition. Treatment of social skills including social perception occurred via 12 two-hour weekly group sessions

supplemented by weekly individual sessions designed to support skills learning in groups and address individual issues in terms depression, anxiety etc. General social skills were evaluated via two questionnaires pre-treatment: the KATZ-R and the Social Skills Performance Survey (SPSS). Social perception was evaluated via The Awareness of Social Inference Test (TASIT) and improvements in levels of functioning were assessed via the Sydney Psychosocial Reintegration Scale (SPRS). Depression was assessed via the Depression, Anxiety and Stress Scale (DASS). These same measures were taken post-treatment. Results indicated significant improvements in social perception only.

The Evidence Base of Neuropsychological Rehabilitation: How Good Is the Research?

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PsyncBITE™ is a new web-based resource (www.psycbite.com) indexing published studies from a range of medical and allied health disciplines, that provide empirical evidence of the effectiveness of non-pharmacological rehabilitation interventions for the psychological consequences of acquired brain impairment. The aim of this study is to examine the methodological quality of randomised controlled trials (RCTs) and non-RCTs indexed in PsyncBITE™, focusing on five types of intervention: attention therapy, communication therapy, executive therapy, memory therapy and other-cognitive rehabilitation. RCTs and non-RCTs were examined because they are methodological designs that can potentially offer high evidence levels. Studies meeting selection criteria were extracted from 7 generic databases (eg, Medline). They were indexed using 73 terms in 5 domains (problem area, intervention type, neurological group, age group and research design), and rated for methodological quality using the PEDro Scale. By August 2005, 1,207 empirical studies were indexed; 398 (33%) were RCTs or non-RCTs, of which 46% were rated for methodological quality. The majority were memory therapies (32%), other-cognitive rehabilitation (28%) and communication therapies (23%). Trials for executive therapies (10%) and attention therapies (7%) were underrepresented. Mean ratings for RCTs were higher than for non-RCTs across all interventions. Mean ratings ranged from 3.3/10 for executive therapies to 3.8/10 for communication therapies. These results indicate that some types of rehabilitation interventions are relatively under researched. Moreover, the methodological quality of published trials using designs that can, potentially, provide strong levels of evidence for the efficacy of neuropsychological rehabilitation remains modest.

**CONCURRENT SESSION 8:
EMOTIONAL PROCESSING SYSTEMS AFTER TRAUMATIC BRAIN INJURY****Long-Term Ability of Adults With Severe TBI to Interpret Facial Expression**

Lucy Knox and Jacinta Douglas

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There is considerable evidence that individuals with severe traumatic brain injury (TBI) experience problems interpreting the emotional state of others. However, the functional implications of these changes have not been fully investigated. This study explored the relationship between an impaired ability to interpret facial expression and social integration in adults with TBI. Thirteen individuals with severe TBI (PTA >14 days) and an equal number of controls matched for gender, age and education participated in the study. Participants were required to match labels with facial expression in both static and dynamic formats, and to match emotions (facial expressions and labels) to social situations. Social integration was measured using the revised CHART. Two-way ANOVA revealed that participants with TBI had significantly more difficulty interpreting facial expression than controls, and were significantly less accurate in responding to dynamic than static presentations of facial expression. TBI participants also scored significantly lower than controls on tasks of matching emotions to social situations. Significant relationships were established between social integration and ability to interpret facial expression in both static and dynamic formats, and also between social integration and ability to match situations with both facial expressions and labels of emotions. This is the first study to find a significant relationship between ability to interpret facial expression and social functioning in individuals with severe TBI. These results support the inclusion of therapy targeting this area within rehabilitation programs. The efficacy of intervention techniques for this deficit will need to be evaluated in future research.

**Impaired Emotional Reactions Following Traumatic Brain Injury:
Findings With the Startle Probe**

Clare Saunders, Skye McDonald, and Rick Richardson

School of Psychology, University of New South Wales, Australia

Traumatic brain injury (TBI) commonly affects a person's ability to recognise emotional information as well as altering a person's emotional experience. These deficits may result from compromised neural systems involved in both the recognition of emotional material and in affective reactions to emotional stimuli. The study employed affective modulation of startle to examine the impact of TBI on reactions to affective pictures. In control populations the magnitude of the eyeblink response to a startle probe is reduced when viewing pleasant pictures (e.g., erotica) and increased with unpleasant pictures (e.g., mutilated bodies). This pattern has been framed within the notion of motivational priming: the startle reflex (a defensive response) is enhanced or inhibited, depending on whether the foreground stimulus evokes a state of aversive readiness, matching the reflex, or a state of appetitiveness, countering the reflex. In order to examine affective modulation of startle in people with TBI, we measured eyeblink responses to pleasant, unpleasant and neutral pictures. Subjective ratings of emotional arousal and valence were obtained for each picture category. TBI impaired the normal potentiation

of startle to unpleasant pictures, but did not affect normal attenuation of startle to pleasant pictures. Subjective reports indicated that although TBI participants were aware unpleasant pictures were indeed unpleasant, they found unpleasant pictures less arousing than did controls. Results are consistent with reports of reduced emotional responsivity and specifically with recent evidence of differential impairment in negative versus positive emotion following TBI.

Emotional Processing After Brain Injury

Heather Conroy,¹ Marjorie Collins,¹ and Rodrigo Becera²

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Emotional processing deficits are a common aftermath of brain injury. Many of these deficits are similar to those found with alexithymia, which is a condition characterised by an inability to recognise and verbalise one's own feelings. This study investigated whether alexithymia develops after brain injury in individuals who previously did not show signs of alexithymia. Thirty four patients with acquired brain injury completed a Twenty Item Toronto Alexithymia Scale which was modified to assess current and pre-morbid alexithymic characteristics. Emotional processing was assessed using lexical and facial perception tasks from the New York Emotion Battery relative to performance on matched non-emotional control tasks. Findings support clinical observations that alexithymic characteristics develop in some patients after ABI. Performance on the lexical tasks suggest that problems with processing emotional words were related to right cerebral hemisphere damage, but not to alexithymia characteristics. In contrast problems with constructing emotional meaning from sentences were related to alexithymia, but not to damage of a particular hemisphere. These findings suggest that an interaction between hemisphere of injury and the presence of alexithymia could underlie emotional processing problems in some individuals with acquired brain injury. This indicates that rehabilitation for individuals who 'acquire alexithymia' after ABI could be better directed at raising awareness of interpersonal communication cues, developing emotional vocabulary and promoting verbal and nonverbal expression of emotion.

Emotion Recognition, Executive Dysfunction and Theory of Mind Following Traumatic Brain Injury

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² *School of Psychology, University Of Aberdeen, Scotland, United Kingdom*

A number of studies have now documented that traumatic brain injury (TBI) is associated with deficits in the recognition of basic emotions, the capacity to infer mental states of others (theory of mind), as well as executive functioning. However, no study to date has investigated the relationship between these three constructs in the context of TBI. In the current study TBI participants ($N = 16$) were compared with demographically matched healthy controls ($N = 17$). It was found that participants with TBI were significantly impaired in their recognition of basic emotions, as well as in their capacity for mental state attribution. Performance on these two measures was strongly correlated in the control, but not in the TBI sample,

consistent with the possibility that these abilities are subserved by distinct neural substrates. Further, theory of mind, but not basic emotion recognition, was substantially correlated with performance on a measure of executive functioning (verbal fluency) in the TBI (but not the control) sample. For the TBI but not the control group it was also found that verbal fluency performance explained significant and substantial unique variance in theory of mind performance, even after controlling for verbal intelligence, psychomotor speed, and basic emotion recognition. These results are consistent with other evidence indicating that deficits in executive functioning partially underlie deficits in social cognition following TBI. The pervasiveness of executive function impairments following TBI may therefore explain the prevalence of social dysfunction in TBI.

Emotion Recognition, Posttraumatic Stress and Alexithymia in Adults With Severe Traumatic Brain Injury

Julia Rosenfeld and Skye McDonald

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In previous research it has been established that many adults with severe traumatic brain injuries (TBI) have deficits in the recognition of emotional expressions. It has also been suggested that such deficits may be linked to a change in the subjective experience of emotion in this group. However, given recent work has indicated that people with TBI may experience posttraumatic stress disorders (PTSD) and given that PTSD is also associated with emotional changes and impaired emotion recognition this is a potential confound which requires examination. This was the aim of this study. Nine women and 11 men with severe TBI of mean age 44 years (mean duration of PTA = 104 days) and 20 control participants (university students) of mean age 21 were asked to (1) match and (2) label emotional expressions (from the Ekman & Freisen series). They were also asked to complete the Post Traumatic Diagnostic Scale (PTSD) and the Toronto Alexithymia Scale (TAS-20) to measure alexithymia, that is, changes in the ability to experience and describe emotions. Fifty per cent of the TBI group, but no controls, had clinically diagnosable PTSD. Forty-five per cent of the TBI group, but no controls, were alexithymic according to the established cut-offs for these two instruments. The TBI participants were significantly impaired relative to controls for matching and labeling negative emotions. PTSD scores did not correlate with these tasks suggesting the two were unrelated. In contrast, alexithymia scores were related to both emotion tasks providing further evidence for a link between emotion recognition and emotional experience.

POSTER PRESENTATIONS

A Case Study in Treating Compulsive Behaviour After Severe Traumatic Brain Injury

Lucius Arco

Edith Cowan University, Australia

Although compulsive behaviour has been reported as one of many anxiety-related sequelae of brain injury, little empirical data of its responsiveness to psychological intervention are available. In this study, a single participant changing criterion experimental design was used to evaluate an in-home neurobehavioural intervention for compulsive behaviour of an adult with severe traumatic brain injury. The participant was a man aged 24 years who had sustained frontal-temporal lobe brain trauma 12 months earlier and presented with compulsive counting and urinating. The neurobehavioural intervention consisted of regular in-home consultations, self-regulation procedures including specifying and daily self-recording of compulsive behaviour, stress-coping strategies, errorless remediation, and social reinforcement, and gradual fading of intervention. Baseline showed counting occurred on average 80% of the day, and voiding of bladder 12 times per day. Intervention produced elimination of compulsive counting, bladder-voiding 7 times per day, and participant's reports of satisfaction with intervention methods and outcomes. Results add to the paucity of data that show effective self-regulated treatment of compulsive behaviour of motivated individuals with family support.

Effectiveness of an Adult Handwriting Training Program

Marika Beaudet and Annie McCluskey

University of Western Sydney, Australia

To date, no research has explored the rehabilitation of handwriting for adults post brain injury. This lack of research presents a challenge for rehabilitation therapists who assess and retrain adult handwriting. This study aimed to evaluate the effectiveness of a two-week adult handwriting retraining program. Three females and one male with traumatic brain injury participated (range 21 to 45 years of age; one to 18 years post-injury). A single subject design was used, including baseline, training and post-training phases; each phase lasted two weeks. Overall study duration was 6 weeks. The primary outcome measure was the Handwriting Assessment Battery (HAB), a recently developed test of adult writing performance. The HAB comprises 8 subtests derived from the Motor Assessment Scale, the Jebsen-Taylor Test of Hand Function and the Evaluation Tool of Children's Handwriting. The HAB was administered three times weekly for 6 weeks and included task-specific training tailored for each participant, focusing on pen control, speed and legibility. Participants practiced at home for up to 5 hours a week. An experienced clinician gave individual feedback for 3 hours per week. After 2 weeks, all 4 participants had increased their writing legibility, by 45.2%, 33.3%, 24.1% and 11.5% respectively. Changes in legibility were considered clinically important in two of the four cases. This presentation will provide therapists with practical ideas for measuring and training handwriting performance in people who are many years post-brain injury.

Transcranial Magnetic Stimulation in the Treatment of Neuropsychological Dysfunction

Jason Paul Buttigieg, Stephen Vaughan, Tomas Kron, John Patterson, Barry Muddle, and Ron Slocombe

Australia Atomic Research Team and The University of Ballarat, Australia

Chronic brain diseases are often associated with enduring physical brain abnormality that produce specific behavioural dysfunction. Common chronic brain diseases include Alzheimer's disease, multiple sclerosis, Parkinson's disease and temporal lobe epilepsy. Mental disturbances such as profound memory loss and depression are widely experienced by those with such brain disease and may contribute to a reduced quality of life. Transcranial magnetic stimulation (TMS) provides a novel and promising approach to the treatment of these diseases. TMS provides a release of magnetic pulses that modify neural transmission and alter brain chemistry in order to treat brain dysfunction. Several empirical studies report on the effectiveness of TMS to treat chronic brain disease. However, research has not yet clearly identified how TMS works to improve neurological function especially across different conditions. There is also concern that the magnetic parameters associated with TMS can destroy cellular organelles causing cell loss and irreversible brain damage. The Australian Atomic Research Team brings together research contributors from the Peter MacCallum Cancer Institute and the Universities of Ballarat, Melbourne, Monash and Swinburne with expertise in neuropsychology, oncology, surgery, instrumentation and physics in order to conduct a series of empirical studies using a variety of coil designs and magnetic field parameters that aim to better understand TMS — cellular interactions. Analysis of TMS — cellular interactions will help identify better application parameters of TMS. This research will provide for a better understanding of the treatment of chronic brain disease using TMS so as to help maintain/restore an individual's executive functions and improve quality of life.

Volumetric MRI Assessment of Neural Atrophy and Neuropsychological Dysfunction in Temporal Lobe Epilepsy: A Neuropsychological, Neurological and Neurosurgical Study

Jason Paul Buttigieg, Rosalyn Shute, John Song, Mark Cook, Stephen Bowden, and Lucus Litewka

The University of Ballarat Australia and Victorian Epilepsy Centre, St Vincent's Hospital, Australia

Temporal lobe epilepsy (TLE) is one of the more common forms of epilepsy and is often associated with neural atrophy of hippocampal regions and mood and memory disturbance. This research brings together neuropsychology, neurology and neurosurgery in an attempt to further explore brain-behaviour relationships in people with TLE. The research follows from a preliminary study conducted at Melbourne's Victorian Epilepsy Centre, St Vincent's Hospital, using quantitative volumetric MRI to measure the volume of the parahippocampal gyrus in 20 controls and 37 patients with TLE. A key finding was that a reduced volume of the right parahippocampal gyrus in patients was correlated with higher mood scale (depression and anxiety) scores. The present research at the University of Ballarat takes this further by evaluating the relationship between neural atrophy involving more than one region with mood and memory disturbance; such

research is lacking, especially in young to middle-aged people. The research will utilise volumetric MRI to determine whether neural atrophy in TLE involves the hippocampus and entorhinal and perirhinal cortices. Research involving the inclusion of several neural circuits/networks instead of isolated structures, would arguably provide for a more complete understanding of brain-behaviour relationships in people with TLE in relation to executive dysfunction, thus improving current assessment and treatment protocols.

Participation Focus in Community Rehabilitation: 'Don't Focus on My Problems, Just Help Me Get Back into Life'

Anna Castle-Burton and Lauren Alach

Australian Rehabworks, Australia

Traditionally community-based rehabilitation has focused on a person's impairments in setting goals and formulating treatment plans. Individual team members are used to working on 'fixing' a person's problems. Stakeholders are also increasingly concerned about the 'big picture' for a person who has suffered a traumatic brain injury (TBI) and questioning the value and money spent on services that may not have assisted a person improve their overall participation in life. We believe a shift is needed to participation focused rehabilitation across all disciplines working with people with a TBI in the community. We believe focussing on participation rather than on impairment, improves quality of life, social functioning and reduces dependency on long-term treatment. Detailed rationale will be provided. We will identify how a focus on impairment by multidisciplinary team members can lead to setting of unachievable and unrealistic goals, can foster dependency and can lead to unnecessary service levels. Participation-focused rehabilitation is supported by Sneed and Davis (2002) who suggest that client's identified criteria can be a more accurate measure of an individual's quality of life than objective measures of disability. The World Health Organization recognises the importance of participation in the recently updated International Classifications of Functions (ICF) WHO 2001 replacing the terms 'impairment, disability and handicapped', with 'body functions and structures' and 'activities and participation'. A case study will be presented which highlights the difference and importance of participation focus goal setting versus impairment focused planning.

Brain Pathology Screening Using Lanyon's Psychological Screening Inventory

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² *Private Practice, California, USA*

This study evaluates the Psychological Screening Inventory (PSI) as a screening instrument for pathology. The behavioural metric is based on the number, quality, and temporal sequence of 'false' responses (Berg's Deviation Hypothesis). The 130-item PSI requires the answer 'generally true' or 'generally false' according to the subject's self-description. The records of 60 referred clients assessed for the residual effects of traumatic head injury were compared to those of 81 candidates assessed for selection as representatives in a pharmaceutical organisation. These records were re-scored by totalling the number of false (F) responses in each record, and then totalling the number of 'deviant F' (DvF) responses as proposed by Frankle.

The DvF response is an answer 'false' to an item most frequently answered 'true'. The relationship between these two scores was expressed as a ratio from the formula (4th root DvF*1000)/F. The Kruskal-Wallis Non-Parametric Test was applied to the Ratio scores of the two groups, followed by applying 30 to Ratio as a cut-off score. The analysis showed a significant difference due to Group (*Chi-Square* 79.28 *df* 1; *Asymp. Sig* < .001). The proposed cut-off score of 30 indicated that 2/81 control subjects (2.5%) and 50/60 TBI subjects (83.3%) were classified as possibly brain disordered. Application of recent 'misrepresentation' scales did not confirm malingering as an explanation. This simple inventory may be used as a preliminary screening procedure in a wide variety of contexts, especially as a predictor of possible pathology requiring more detailed assessment.

The Smart Goal Evaluation Method (Smart-Gem): A New Rating-Instrument for Use by Allied Health Professionals

Lise Mogensen, Julia Bowman, Natasha Lannin, Cathy Cook, and Annie McCluskey
University of Western Sydney, Australia

Recent research has revealed that therapists struggle to write clinically useful treatment goals. No refined methods have previously been developed to evaluate how well therapists write treatment goals. The aim of this study was to develop a valid, reliable method to evaluate written clinical goals. The SMART-GEM was developed on the basis of the SMART goals model guided by recognised goal-setting attributes from psychology, occupational therapy and rehabilitation literature. This study involved the development, content validity assessment and a pilot study of interrater reliability of the SMART-GEM. Content validity was assessed by an expert panel with ten members using a multistage process including qualitative and quantitative methods. Quantitative data were analysed using the Content Validity Index (CVI). The interrater reliability was tested using three trained raters to score 10 random goal samples independently. Rater results were analysed using Intraclass Correlation Coefficients (ICC) and Kendall's Coefficient of Concordance (W). The SMART-GEM was rated as content valid (individual items: CVI = 0.9 to 1.00; SMART-GEM CVI = 0.99; $p = .05$). Agreement between raters on individual domain scores varied from low ($W = 0.33$; $p = .44$) to very good ($W = 0.83$; $p = .0001$); overall scores were good (ICC: 0.625; $p = .001$; 95% CI: 0.251–0.877). Concordance of overall grades was very good ($W = 0.82$; $p = .008$) and internal consistency of items was strong (α : 0.821). The SMART-GEM is a valid, systematic method to evaluate the content of written treatment goals and may also guide structured goal writing in allied health.

The Effectiveness of Reminders on Recall of Complex Events for People With Severe Traumatic Brain Injury: A Within-Subject Study

Blanche Savage and Skye McDonald
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Memory impairments are ubiquitous in adults with traumatic brain injury (TBI). Previously we examined whether people with severe TBI would benefit from reminders when recalling complex events (i.e., videotaped scenes). There was suggestion of a differential improvement for those who had reminders. However, the heterogeneity of the two TBI group (those with

reminders vs. those without) may have preempted any systematic effects emerging. In this study we replicated the design, using each TBI participant as their own control. Eighteen adults (4 women and 14 men) with severe (mean PTA = 99 days), chronic (mean time post trauma = 11 years) injuries watched 2 videos comprising 12 unrelated scenes in order to 'rate enjoyment'. They were given an intervening task for 30 minutes, following which they were shown photos representing 6 events in either Video A or Video B for 20 seconds in order to rate how well these matched their memory of the videos. This procedure was repeated three times. Following this participants were given another intervening task for 30 minutes and then asked to recall everything they could for both videos. Significantly more events and more details per event were recalled for the 'reminded' videos than the non-reminded. Increased recall for auditory details would suggest greater memory for the video itself rather than the reminders per se. However, this was inconclusive. There was a trend for greater auditory details to be recalled in the reminded events but this was not significant ($p = .09$).

A Model of Consistency: Competency-Based Rehabilitation

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A person's capacity to relearn old skills or gain new ones following a brain injury is often frustrated by an inability to conquer a specific component essential to the performance of a task. This problem can be amplified by a failure to identify which component is the 'stumbling block' resulting in many wasted hours practicing mistakes rather than developing strategies to overcome or bypass the challenging component. Learning can also be diminished by an inconsistent approach from direct care workers who have no method for understanding exactly what is trying to be achieved. Within the Brightwater Brain Injury Rehabilitation Service, the establishment of competencies which rely on effective task analysis, skill identification and a consistent approach to learning is proving to be not only an effective method of skill development but is also providing an effective framework for measurement of client progress. Use of the principles of adult learning ensures that not only are direct care workers aware of how to support the client in the learning process but the client themselves has a clear understanding of what they are trying to achieve. The competencies can be many and diverse relating to a wide range of life skills including road crossing, medication management and cash control. They are fast becoming an integral part of rehabilitation service delivery for people with brain injuries with in Brightwater Care Group.

Construct or Destruct: The Importance of Creating Portable Structure for Clients With Acquired Brain Injury

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Failure to carry over skills developed within rehabilitation programs post discharge is a common issue for people with an acquired brain injury. This can result in higher dependency on families, readmission to hospital, increased levels of support from care agencies and even permanent accommodation in an institutional setting. The challenge for the interdisciplinary

team at Brightwater's Oats St Rehabilitation Facility was to create a portable structure that could be individualised for each client and that was transferable to and functional in their selected accommodation option. By working as an interdisciplinary team that focuses on outcomes rather than discipline specific goals a competency-based program has been developed. This program, by its individualised focus, integrates effectively with Brightwater's organisational philosophy of a person-centred approach to service provision. The structure within the program is multifaceted and includes a strong overarching structure to the program itself as well as providing a structure for each of the different skills that the client may need to develop to live independently. Structure within the program includes a series of graduated criteria that enable the client to move through the program with a clear understanding of the basic life skills they require. A system of planners, diaries and cashbooks give clients day-to-day control over their lives and responsibility for participation in their program. Competencies for a range of skills provide a structured way of working and reporting for direct support workers as well as a clear guideline for clients to self-monitor skill development.

Primary Prevention and Research in Paediatric Rehabilitation: The Shaken Baby Prevention Project

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Every year Australian children are injured or die from non-accidental brain injury. Many of these children are harmed by an adult who has shaken the child out of the frustration and distress that has arisen while caring for the child. The Brain Injury Service at the Children's Hospital at Westmead provides assessment, therapy and long-term follow up for infants who have sustained such injuries. This poster will outline the long-term implications of nonaccidental injuries and the issues for rehabilitation. It then considers the history, rationale and progress of the Shaken Baby Prevention Project, a primary prevention collaborative project with Westmead Hospital, Sydney West Area Health Service and the NSW Department of Community Services. The project seeks to disseminate information to parents, carers, perinatal health educators and other stakeholders about both positive and safe ways of managing a crying baby, and the dangers of shaking a baby. The project has developed a 3-minute animated film, information leaflet, poster and training package, which can be delivered by a variety of professionals who are in contact with parents and carers focusing on the perinatal period.

The Nature of Self-Identified Goals and Ability to Set Realistic Goals According to Stage of Recovery Following Acquired Brain Injury

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Past research highlights the importance of collaborative goal setting and identifies various factors influencing the goals setting process for individuals with acquired brain injury (ABI), including barriers such as impaired self-awareness and difficulty setting realistic goals. The objectives of the

present study were, firstly, to develop a classification framework to investigate the nature of self-identified goals following ABI and, secondly, to examine how the nature of self-identified goals and ability to set realistic goals varies according to stage of recovery. Participants included 60 people with an ABI, comprising two subgroups; a post-acute subgroup ($n = 28$, mean time since injury = 1.14 years, $SD = 0.53$) and a long-term subgroup ($n = 32$, mean time since injury = 4.9 years, $SD = 3.0$). Participants completed the Self-Awareness of Deficits Interview (SADI) at an initial assessment and 12-month follow-up assessment. Goal statements were obtained from the interview and analysed both qualitatively and quantitatively. Using inductive analysis, a classification framework was developed, consisting of the following six main goal categories: 'relationships', 'work and education', 'injury/rehabilitation', 'health and leisure', 'daily life management' and 'goal uncertainty or no change'. The results indicated that the long-term subgroup identified more health, leisure and daily life management goals and were less likely to identify injury/rehabilitation goals than the post-acute subgroup at the 12-month follow-up. Overall, participants ($n = 60$) displayed an improved ability to identify realistic goals over time ($p = .013$), irrespective of their subgroup membership. The classification framework highlights specific goals areas valued by individuals with ABI and emphasises the importance of tailoring rehabilitation plans and interventions accordingly.

Treating Depression After Traumatic Brain Injury: A Pilot Program

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Emotional difficulties such as depression are frequent and often disabling conditions after traumatic brain injury (TBI) and may prevent people from engaging in rehabilitation and maximizing participation in employment, social and leisure activities. Depression has also been linked to increased expression of aggressive behaviours. The treatment of depression in the general population using a cognitive behavioural approach has demonstrated effectiveness and group formats have shown particular benefit. However, such programs tend to make considerable demands on cognitive capacities such as attention, memory and abstract thinking skills and may therefore be unsuitable for those who have sustained a severe TBI. The development of the group program described, known as Beating the Blues, drew upon existing treatments for both TBI groups and the general population. Session content was substantially modified to allow for memory and other cognitive difficulties. Topics included education on brain injury and its effects on emotions, increasing activity levels, stress management, learning to think more positively, goal setting, problem solving skills and relapse prevention. The program consisted of eight 2-hour sessions, a family session, and 1-month and 3-month follow-up sessions. The involvement of a close family member or friend was encouraged to provide support and reinforce the use of the strategies at home. Six individuals completed the group in 2005. Outcome measures included comparison of pre- and posttreatment rating scales of depression and psychological state and participants' feedback. Preliminary results are promising but lack significance given the small numbers. Implications for tailoring treatment approaches to a cognitively impaired population will be discussed.

A System for Summarising Goal-Based Outcomes for Clients Undergoing Brain-Injury Rehabilitation in Community Settings

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Evaluating progress in achieving individual goals is an important measure of rehabilitation outcome. However, given their idiosyncratic nature, it has been difficult to summarise large numbers of client goals. A recently developed goal taxonomy provides a comprehensive framework of 21 categories (e.g., physical, cognitive, community skills) that can reliably classify goals commonly set in community-based rehabilitation. The current study piloted an approach that integrated the taxonomy with a modified goal attainment scoring system to provide summary data on client outcomes. A review was conducted of rehabilitation plans for a sample of 11 clients (7 males, 64%) from the Community Outreach Team of the Brain Injury Rehabilitation Unit at Liverpool Hospital. The sample sustained extremely severe injuries (median posttraumatic amnesia 53 days, IQR 59) and were a median of 5 months post-injury at the time of their first plan (IQR 6 months). Goals were extracted from an aggregate total of 58 rehabilitation plans (median 5 plans, range 2–11 plans). Goals were classified into the 21 taxonomy categories. The level of goal attainment was also recorded using a modified goal attainment scoring system (*not achieved, partially achieved, achieved, achievement plus*). A set of descriptors was also created to summarise the reasons why goals were *not achieved*. In addition, the rate of conversion of *partially achieved* goals into *achieved* goals in subsequent rehabilitation plans was also recorded. Combining the goal taxonomy with a modified goal-attainment scoring system promises to provide a parsimonious, reliable and comprehensive approach to summarising goal-based outcomes for clients undergoing rehabilitation in community settings.

The Sibling's Experience: When a Family Member Sustains a Traumatic Brain Injury

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The literature identifies families are impacted and their life is changed when one family member suffers a traumatic brain injury (TBI) (Perlesz et al., 1999; Ponsford et al., 2003). However, there has been little attention given in the literature to the impact upon the sibling's life since a study by Willer et al. (1990). This topic is addressed in the following study. This qualitative study aimed to explore the impact upon the adult sibling's life when their brother or sister suffers a TBI. Four siblings participated in an in-depth interview. The siblings were aged late adolescence or early adulthood at the time of their sibling's injury. Their brother or sister suffered a severe TBI at least 3 years prior to the study. The principles of grounded theory were applied identifying the themes emerged from these case studies. The findings of the study identified the siblings were significantly impacted for years following the event. Each sibling described they continued to experience a mixture of strong emotional responses. They felt profound sadness for their losses and for their sibling's losses. They constantly worried for their injured

sibling's future. Love and admiration of their sibling's achievements was also highlighted. Each sibling described their relationships changed with their family and friends. However, their lives displayed positive adaptation and growth despite these complex changes. Interestingly, the siblings in this study felt neglected and forgotten by the professionals. This paper has presented the findings of this small, but insightful, study of the adult sibling's experience. Recommendations for professionals to assist the sibling during the rehabilitation process are also presented.

Evaluating the Efficacy of Suicide Prevention Training for Staff Working in the Field of Traumatic Brain Injury (TBI): A Replication Study

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Simpson and colleagues (2003) previously reported on the efficacy from a pilot suicide-prevention workshop conducted in Melbourne for staff working in the field of traumatic brain injury (TBI). The evaluation found that participants attending the workshop made gains in knowledge and self-rated skills in comparison to a control group. A principal components analysis of the self-rating measure produced a 2-factor solution which accounted for 70% of the variance, with both factors having good internal reliability. The current project aimed to replicate the findings from the study by evaluating the outcomes from further multisite training conducted across Victoria in 2003. A total of 86 staff attended the one-day workshops in four regional centres and a control group of staff ($n = 27$) were recruited from the state of NSW. Participants completed an objective knowledge test and a 12-item self-rating survey of their knowledge and skills on three occasions (pre-workshop, post-workshop, 6-month follow-up). At one site, the Suicide Intervention Response Inventory — 2 (SIRI-2; Neimeyer & Pfeiffer, 1994), a generic measure of the clinical knowledge of respondents in managing suicidal clients, was also administered as a validating measure. Workshop participants had made significant gains compared to their pre-workshop assessments on both the objective knowledge test and self-rating of knowledge and skills. These gains were maintained at the 6-month follow-up. The controls had equivalent pre-injury scores on the measures but made no similar gains at follow-up. A confirmatory principal components analysis was conducted which produced a similar 2-factor solution to the original study, accounting for 65.6% of the variance. The SIRI-2 was significantly correlated with the objective knowledge test scores ($r = -.59$, $p = .012$) but not with scores on the self-rating measure. In the course of their routine duties, rehabilitation and disability staff are often confronted by clients with TBI experiencing suicidal distress. The evaluation results from the current investigation replicate the findings from the original study by Simpson and colleagues (2003), suggesting that the workshop is a useful mechanism for upgrading the knowledge and skills of staff in managing these complex and challenging clinical presentations.