

# Abstracts of the 30th Brain Impairment Conference, 3–5 May, 2007, Brisbane

## Conference Theme: Ecological Practice: Assessment and Rehabilitation

### PRECONFERENCE WORKSHOPS

#### WORKSHOP 1

##### **It's Just One Brain: Effective Integration of Interventions for Cognitive and Emotional Consequences of Brain Injury**

Catherine Mateer

*Department of Psychology, University of Victoria, Canada*

The combined impacts of traumatic brain injury (TBI) on physical, cognitive, and emotional functioning are well known, but we are only beginning to recognize the degree to which these areas intersect with and impact each other. It is still common to conceptualise and develop rehabilitation strategies that address them separately with the result that important interactions can be missed. There is also related new research suggesting that the beliefs that individuals who have sustained a TBI hold about their cognitive functioning and the effects of their injuries strongly impact mood, adjustment, and engagement. Treatment approaches that focus on reshaping these beliefs and that provide a more integrated treatment focus on cognition, metacognition, mood, and behaviour, including modified forms of cognitive behaviour therapy, can be highly beneficial in an integrated and holistic approach to rehabilitation.

#### WORKSHOP 2

##### **A New Kind of Advocacy for People With Communication Disabilities: Developing Communication Training Programs for Public Agencies and Everyday Communication Partners**

Leanne Togher

*Communication Sciences and Disorder, Faculty of Health Sciences, The University of Sydney, Australia*

Enhancing communication of people with traumatic brain injury (TBI) and other communicatively disabled populations is typically viewed as within the realm of speech pathology practice. Models of service delivery remain largely focused on one-to-one individual treatment which is complemented by communication group treatments for the person with TBI. While there is substantial evidence that these approaches can make a difference in controlled contexts, there remains a paucity of data to suggest that this method of treatment improves communication for the person in their everyday life. A frequently reported problem for people with communication disability is the

response they receive from everyday communication partners in the community. For example, communication partners may use a patronising tone, have few resources to deal with inappropriate or challenging behaviours, such as tangential topic shifts, or they may avoid interactions with the person with TBI altogether. This can then lead to social disadvantage for the person with TBI across all aspects of their life, including reduced access to health, social and legal resources. To address this issue, a new kind of advocacy is proposed, whereby the communication partners are the focus of the treatment. Participants in this workshop will experience a training package that has been developed for law and justice personnel and is currently in use as part of the Disability Awareness Training Program at the Attorney General's Department of NSW and the NSW Police Academy. Other approaches to training communication partners, including family, friends and health professionals will also be discussed based on current and previous research findings by the author.

## WORKSHOP 3

### **Motor Learning Implications for Rehabilitation of Upper Limb Function After Stroke**

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Mary Galea

*School of Physiotherapy, Director, Rehabilitation Sciences Research Centre,  
The University of Melbourne and Austin Health, Australia*

**F**unctional recovery of the paretic upper limb continues to be one of the greatest challenges faced by rehabilitation professionals. In recent years, however, there has been a paradigm shift in the understanding of adaptive processes in the central nervous system in response to environmental manipulations or injury. Converging evidence from both animal and human studies suggests that postinjury behavioural experience is a major modulator of the morphological and physiological changes that take place in undamaged regions of the brain. Evidence from animal studies indicates that the recovery process and the nature of the accompanying brain reorganisation depend on activity during the rehabilitation process as well as on the rehabilitation environment itself. Motor learning or problem solving, rather than mere repetitive motor activity, is also a prerequisite factor driving representational plasticity. Goal-directed training with distributed practice schedules and task variability will also promote the development of appropriate internal models to increase generalisation of learning to new tasks. The application of these principles to rehabilitation has the potential to profoundly influence the outcome for the affected upper limb following brain injury.

## WORKSHOP 4

### **Beyond Trial and Error: Theory-Driven Methods of Memory Assessment and Remediation**

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Eli Vakil

*Psychology Department and Gonda Multidisciplinary Brain Research Center, Bar Ilan University, Ramat-Gan, Israel*

The sophistication of clinical approaches to memory disorders, including methods of assessment and remediation, may sometimes seem to lag far behind theoretical advances of the past two decades in our understanding of memory processes. It is now widely accepted that memory is not a unitary phenomenon, but rather reflective of several independent cognitive processes, subserved by different brain structures. These manifold aspects of memory should be reflected in clinical instruments of memory assessment and remediation — but this does not seem to be the case. For instance, the dissociation between explicit and implicit memory is well established. However, while tests of explicit memory (e.g., recall & recognition) may be found in most memory batteries, tests tapping implicit memory (e.g., priming & skill learning) are not well represented. Furthermore, the differential sparing of various memory systems is rarely utilised as a strategic fulcrum for memory remediation techniques. In this workshop I will survey a number of important dissociations between memory systems, and illustrate how this multiplicity of memory abilities can (and should) be reflected in memory testing and remediation.

## WORKSHOP 5

### **The Usefulness of the ICF Framework for Assessment and Therapy**

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Brigitte Larkins

*Canterbury District Health Board and University of Canterbury, New Zealand*

The International Classification of Functioning, Disability and Health (ICF) was published by the World Health Organization in 2001 to serve as an universal framework for understanding the functional health of persons and populations. The focus of the workshop will be exploring how the ICF provides a framework that supports the ecological assessment and rehabilitation of clients with brain injury. The ICF framework provides rehabilitation professionals with a mechanism to explore and to organise important information, including functional behaviours and environmental factors, in a standard way using a common language. This functional approach to assessment can lead to more appropriate goal setting by the clinician. The ICF provides a structure for relevant assessment that can lead to clients reaching their meaningful life goals. The ICF is not an assessment tool, however, discussion will refer to the Index for Social and Vocational Communications (SAVCO), which used the ICF as a primary test construct.

**PRESIDENTIAL ADDRESS****Clinical Applications of Advances in Neuroscience to the Assessment of Brain Injury**

Gina Geffen

*Director, Cognitive Psychophysiology Laboratory, Schools of Psychology and Medicine, University of Queensland, Australia*

In the mid-20th century, neuropsychologists and neurosurgeons began the modern era of functional mapping of the human brain using open, awake brain stimulation and ablation. By the end of the century, less invasive methods of functional brain mapping, such as single photon and positron emission tomography, topographic electro- and magneto-encephalography and functional magnetic resonance imaging had been introduced into clinical practice. Since the start of the 21st century, there have been ever increasing improvements in the temporal and spatial resolution of these newer methods, coupled with an increasing availability of shared normative data banks. The challenges facing clinical practitioners in the field of brain impairment from the advent of the newer methods derived from advances in neurosciences include the cost of utilising these techniques and the difficulties of interpreting the data provided. The potential and the perils of the clinical application of modern neuroscience methods to routine clinical practice will be considered, a *modus vivendi* sought, and a *modus operandi* suggested.

**KEYNOTE ADDRESS 1****Communication Disability After Traumatic Brain Injury: A New Way Forward**

Leanne Togher

*Communication Sciences and Disorder, Faculty of Health Sciences, The University of Sydney, Australia*

The traditional way of managing communication problems following severe traumatic brain injury (TBI) has been to focus treatment on the individual with the injury. This approach has some merit, with recent studies suggesting behavioural and cognitive deficits experienced by people with TBI, thought to contribute to their loss of communicative competence, are amenable to remediation. Additional evidence for this approach is a systematic review of treatment outcomes in TBI which indicated that the broad area of social skills, which encompasses communication skills, was one of only two areas that proved amenable to treatment (Cicerone, Dahlberg, Kalmar et al., 2000). However, properly controlled treatment studies in this area are virtually nonexistent. An alternative way to deal with problematic communication is to improve the skills of communication partners of people with TBI. Dealing with a person with severe TBI can be a challenging experience, particularly for close family and friends, but also for other members of the community. While significant others are often informed of therapy goals during the course of treatment, they are not usually directly involved in the therapy process. Until recently, there have been no reports of controlled trials that aim to improve the everyday interactions of people with TBI by training communication partners. Significant advances in aphasia rehabilitation, such as the use of a social model of disability (Pound, Parr, Lindsay, & Woolf, 2000) and the development of the Life Participation Approach to Aphasia, have not been replicated in the management of communication following TBI. There has been a focus on improving community integration

following TBI; however, there are few specific guidelines for promoting communicative effectiveness throughout this process. This keynote presentation will propose a new way forward in addressing the issue of promoting communicative effectiveness for people with traumatic brain injury, and for other communicatively impaired populations, namely, training communication partners. Recently developed training programs, including a package for law and justice personnel will be described during the presentation. Future clinical and research challenges will also be addressed.

## KEYNOTE ADDRESS 2

### **Opening the Black Box: Analysing the Cognitive Processes to Connect Brain With Behaviour – The Case of Memory**

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Eli Vakil

*Psychology Department and Gonda Multidisciplinary Brain Research Center, Bar Ilan University, Ramat-Gan, Israel*

**P**rogress in understanding brain-behavior relations is certainly dependent on the resolving power of the tools used to map cerebral anatomy and physiology (e.g., fMRI, ERP, etc.). However, such progress is equally dependent on the sensitivity of the methods we employ to analyse cognitive processes. Recent advances in two areas of memory research — context effects and skill learning — provide instructive examples of how carefully designed behavioral/cognitive measures may reveal important brain processes. Research on memory context effects had yielded inconsistent findings regarding its brain substrate. Recent studies conducted in my laboratory have demonstrated how such context effects reflect a diverse range of cognitive processes, some likely mediated by medial temporal lobes, while others are seemingly frontal lobe-dependent. Similarly, careful analysis of acquisition patterns of various skill learning (procedural) tasks suggests the involvement of multiple cognitive processes, mediated by several brain regions. The frontal lobes seem to be most important in the early stages of procedural learning, while the basal ganglia and the cerebellum play an increasingly important role in the advanced stages of the process. These studies stress the importance of fine-grained analysis of the cognitive processes underlying the tasks used to assess brain-behavior relations.

## KEYNOTE ADDRESS 3

### **How Does the Brain Control the Hand?**

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Mary Galea

*Rehabilitation Sciences Research Centre, The University of Melbourne and Austin Health, Australia*

**F**or man and other primates, the hand provides the major interface between the brain and the world round us. The anatomical structure of the hand, direct connections between the brain and the motoneurons innervating hand muscles, and highly sensitive tactile pads on the digits, together permit a vast array of movement possibilities which can be used to approach, grasp and manipulate an object. Dexterity depends on a rapid transfer of sensorimotor information between the cerebral cortex and the spinal cord, predominantly through the corticospinal projections, which consist of multiple

parallel projections originating from many different regions of the cerebral cortex. The motor commands for manipulation are also precisely tuned to relevant physical properties of objects. Tactile information is used to monitor these properties, enabling motor output to be adjusted accordingly. Sensory information is also important for feedforward control of arm movements. The force to be applied must be planned before the initiation of movement to match an object's expected weight and texture, based on internal representations of an object gained through previous experience. This anticipatory control of the force output may be disturbed by central nervous system lesions affecting the sensorimotor cortex. Recovery of sensorimotor function following brain lesions is mediated by a number of factors. The complexity of the corticospinal projections is such that even a major lesion does not eliminate all channels transmitting information between the cortex and spinal cord. The adult brain also has a tremendous capacity for reorganisation in response to experimental manipulations and environmental changes. These observations have implications for the rehabilitation of upper limb function after stroke or other brain injury.

#### KEYNOTE ADDRESS 4

### **Everyday Functioning Through the Lens of Awareness and Executive Control**

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Catherine Mateer

*Department of Psychology, University of Victoria, Canada*

The physical, cognitive and emotional sequelae of TBI often affect the skills necessary for successful completion of everyday tasks and the ability to engage in complex adaptive behaviour. Measures of executive functioning often serve as the best neuropsychological predictors of everyday abilities across domains of function as they tap the underlying cognitive and self-regulatory skills such as complex attention, prospective memory, planning, sequencing, and organization necessary to engage in purposeful activities. Disturbances in self-awareness and self-regulation of mood and emotion, also associated with executive functioning, can significantly impact rehabilitation outcome. This session will review relevant data from the literature on the role of executive functioning in instrumental activities of daily living, financial management, and driving, as well as return to vocational activities, and the use of ecologically valid assessment approaches to assess the impact of executive functioning in these important domains.

#### KEYNOTE ADDRESS 5

### **Context Is Everything**

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Brigitte Larkins

*Canterbury District Health Board and University of Canterbury, New Zealand*

The presentation will discuss the implications of an ecological approach to assessment and intervention with a particular focus on communication disorders following brain injury. Assessment and intervention that includes attention to the client in his or her own context makes a valuable contribution to the rehabilitation process for a variety of reasons. For example, a focus on performance of everyday activities identifies issues which may not

be readily detected in 'traditional' assessment. In turn, intervention that emphasises problematic issues as experienced by the client is more likely to lead to collaboration and cooperation in achieving individualised and meaningful intervention goals. Assessments that take an ecological approach to exploring communication difficulties post traumatic brain injury (TBI) are not readily available. The presentation will describe the process of developing a functional communication assessment that focused on identifying items that are authentic to individuals with a TBI living in New Zealand. Using the International Classification of Functioning, Disability and Health (ICF) as a framework, it will also demonstrate how attending to context may provide practical support for rehabilitation intervention after brain injury because of the ICF's person-centred focus and emphasis on real life outcomes.

## CONCURRENT SESSION 1: STROKE OUTCOMES AND INTERVENTION (SYMPOSIUM)

### **Executive Functions and Employment and Productivity Outcomes Following Stroke**

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Tamara Ownsworth<sup>1,2</sup> and David Shum<sup>1,2</sup>

<sup>1</sup> School of Psychology, Griffith University, Australia

<sup>2</sup> Applied Cognitive Neuroscience Research Centre, Griffith University, Australia

The effects of stroke can considerably reduce individuals' capacity for employment and other productive activities. Few studies have examined the relationship between loss of productivity and deficits in higher-order cognitive abilities or executive functions. The present study examined whether initial performance on tests of executive functions was related to employment and productivity at 12-months follow-up. A sample of 27 individuals (Mean age = 47.3 years, *SD* = 10.7) on average 2.1 years (*SD* = 1.6) post-stroke were recruited from hospital and community rehabilitation services and administered a theory-driven battery of executive function tests (i.e., Health and Safety, FAS Test, Five-Point Test, Key Search Test, and Tinkertoy Test). A 12-month follow-up assessment of employment outcome (classified as 'employed' or 'unemployed') and productivity (measured by the Sydney Psychosocial Reintegration Scale) was conducted. A series of between-group comparisons identified that a measure of purposive behaviour and self-regulation (i.e., the Tinkertoy Test) best distinguished between the employed and unemployed groups ( $p < .01$ ) irrespective of time since injury and neglect. Level of post-stroke productivity was significantly correlated with measures of planning, self-monitoring, and self-regulation. These findings support the need to routinely assess higher-order cognitive functions to guide rehabilitation interventions following stroke.

### **Is There a Better Way to Provide Written Information to Stroke Patients and Their Carers?**

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Tammy Hoffmann,<sup>1</sup> Kryss McKenna,<sup>1</sup> Linda Worrall<sup>1</sup> and Stephen Read<sup>2</sup>

<sup>1</sup> School of Health and Rehabilitation Sciences, University of Queensland, Australia

<sup>2</sup> Department of Neurology, Royal Brisbane and Women's Hospital, Australia

The provision of education to stroke patients and their carers should be an integral component of the poststroke intervention process. Research has shown that the quality and quantity of written information provided to stroke

patients is poor. This study aimed to develop and evaluate a system of providing patients and carers with well-designed, quality information that was individualised according to their needs. In Phase 1, interviews were conducted with 57 patients, and where available their carers, in a stroke unit, prior to discharge and 6 months after discharge, to examine: current practices in the provision of written information; patients' satisfaction with information received, informational needs and reading ability. The written materials received were evaluated using readability formula and a suitability assessment. In Phase 2, a stroke education package that produces computer-generated tailored information for patients and carers was developed and piloted. The package was evaluated in Phase 3 with a randomised controlled trial ( $n = 150$ ). In Phase 1, only 18 (31.6%) participants reported receiving written information while in hospital. Nearly all (96.5%) expressed that they would like more information about stroke. The average reading grade level of the written information received was grade 11 compared to patients' mean reading ability of 7th–8th grade. In Phase 3, participants who received the tailored information were significantly more satisfied with the content and presentation of the information received and desired less additional information at follow-up compared to participants in the control group. Implications for the use of written information with patients who have had a stroke will be discussed.

### **A Pilot Investigation of the Transition From Hospital to the Community for Individuals With Acquired Brain Injury: A Qualitative Study**

Benjamin Turner,<sup>1</sup> Jenny Fleming,<sup>1,2</sup> Petrea Cornwell,<sup>1,2</sup> Terry Haines,<sup>1,2</sup> Tamara Ownsworth,<sup>4</sup> Melissa Kendall,<sup>3</sup> Lesley Chenoweth<sup>5</sup> and Linda Worrall<sup>1</sup>

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**A** key event occurs for many individuals with acquired brain injury (ABI) when they are discharged from inpatient rehabilitation and return home to live in the community. Research suggests that this transition phase is typically perceived as an exciting yet difficult period for individuals and their families. To examine the transition experiences of individuals with ABI and their families. Purposeful maximum variation sampling was used to recruit participants to the study. Participants with ABI consisted of 2 groups: (1) individuals who were less than 6 months postdischarge ( $n = 6$ ); and (2) individuals who were greater than 6 months postdischarge ( $n = 7$ ). Eleven caregivers of individuals with ABI also participated in the study. Participants were interviewed about their views, opinions and feelings concerning their experiences during the transition from hospital to the community. All interviews were audiotaped and transcribed. Inductive analysis of the narrative transcripts to identify themes, codes, groupings or categories of statements was the primary method of data analysis. Eight main themes pertinent to the transition process emerged from the analysis process, which included 'the hospital experience', 'the transition process', 'the role of families', 'post-discharge services', 'social/friendship networks and community involvement', 'participation in meaningful activities and time management', 'physical, psychological and emotional wellbeing', and 'barriers to transition'. A coding framework that summarises the issues impacting upon and

influencing the transition process was developed. Evident from the pilot investigation is the presence of complex issues that need to be considered when planning and developing transition-specific services/programs for individuals with ABI and their families.

## **Cognitive Behavioural Group Interventions for Spouses of Stroke Patients**

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Gabrielle Wilz and Tatjana Barskova

*Department of Clinical and Health Psychology, Technical University of Berlin, Germany*

This study investigates the effectiveness of cognitive behavioural (CBT) group interventions for spouses of stroke patients. The program consists of 15 bi-monthly 1 half-hour sessions. The intervention is aimed at preventing the development of mental disorders and burnout among the caregiving spouses of stroke patients. A longitudinal intervention control group design was used with measurements being taken at three measuring times. The sample consisted of 137 couples (stroke patients and their spouses) divided into one intervention and two different control conditions. We used the following measuring instruments to capture spouses' mental health and quality of life: Beck's Anxiety Inventory, Beck's Depression Inventory, WHOQOL-Bref. Measurements were taken before the intervention (T0), directly following the intervention (T1) and 6 months postintervention (T2). Regression analyses done on the differences of outcome-measures at 3 measuring times allowed for examination of the short-term and the long-term intervention effects. After controlling for baseline criterion (spouses' age, patients' degree of impairment and time since stroke onset) the participation at the intervention program was significantly associated to short-term changes in caregiving spouses' physical as well as environmental quality of life and to long-term changes in spouses' quality of life and depression. The presented CBT-based intervention for stroke survivors' spouses seems to have an immediate effect on caregiving spouses' physical and environmental quality of life. In contrast, the intervention-related changes on more resistant psychosocial variables did not appear until after a latent stage in the later postintervention phase.

## CONCURRENT SESSION 2: EMOTION PERCEPTION AND REGULATION

### **The Relationship Between Cognitive Variables and Emotion Perception Remediation Gains in TBI: Four Case Studies**

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Cristina Bornhofen and Skye McDonald

*School of Psychology, University of New South Wales, Australia*

Recent insights in neuroscience have suggested a dissociation between social-cognitive and more 'nonsocial' cognitive abilities (i.e., conceptual reasoning, memory, and so on). This raises the possibility that cognitive variables from the latter category may play a minimal role in determining the outcome of treatments focused on social-cognitive abilities. To investigate this question, the cases of four individuals who received emotion perception training following TBI are examined with respect to level of cognitive functioning and treatment gains. Data from participants with severe TBI (mean PTA = 56.2 ( $SD = 57.8$ ) days; mean time post injury = 6.65 ( $SD = 7.5$ ) years) who had undergone 25 hours of remediation aimed at improving emotion perception abilities were put into low or high functioning groups on the basis

of pretreatment cognitive scores. Two participants from each group were randomly selected, and their standardised change scores (i.e., pre- vs. post-) on emotion perception measures were compared. In these cases, cognitive variables appeared to influence the level of benefit gained from emotion perception training. Specifically, those with higher overall scores on cognitive measures benefitted most from emotion perception remediation. The influence of cognitive functioning on the outcome of social-cognitive rehabilitation in TBI may be more indirect than direct. The nature of this influence may pertain more to treatment delivery (i.e., verbal instruction and explanation of concepts) than the nature of social-cognitive information itself. At this point, however, it appears clear that social-cognitive programs developed for TBI should take into account the degree of cognitive limitation demonstrated by individual recipients.

### **Does Mimicry Assist People With TBI Recognise Facial Expressions?**

Skye McDonald and Cristina Bornhofen

*School of Psychology, University of New South Wales, Australia*

**T**raumatic brain injury (TBI) can impair the recognition of emotional expressions. Given the importance of such cues in social interactions, we need to find effective remediation methods. Neuroscience research suggests that the somatosensory cortices are integral in the recognition of emotions, whereby excitation occurs “as if” the viewer was experiencing the emotion being observed. Consequently, in this study we addressed the question: can mimicry of emotions (engaging the somatosensory cortices) assist recognition in people with TBI? Twenty participants with severe TBI (PTA = 45 days; time postinjury = 9.7 years) and 20 matched control participants were asked to label 3 sets of Ekman faces each containing 4 x 6 basic expressions (happiness, surprise, fear, sadness, anger and disgust) under 3 conditions: (1) no explicit instructions; (2) asked to focus on the face; or (3) asked to mimic the expression first. Condition (1) was always presented first and conditions (2) and (3) were counterbalanced across participants. Surprisingly, this group of people with TBI did not perform poorly on recognition of emotions (control condition). There was no effect of mimicry. Focusing upon expressions improved accuracy for surprise in the control participants but had the reverse effect on people with TBI. Possible reasons for the lack of significant effects in this study include the effects of prior remediation on emotion recognition. Further data will address this possibility and clarify whether the use of mimicry is likely to be a useful adjunct to the remediation of emotion recognition.

### **The Measurement of Social Cognitive Functioning After Closed Head Injury**

Julian J. Dooley<sup>1,2,3</sup> Vicki Anderson<sup>1,2,3,4</sup> and Jeneva Ohan<sup>5</sup>

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**S**pecific patterns of information processing have been strongly associated with negative behaviours like aggression. These patterns have been assessed using vignettes describing social interactions which instruct the participant to imagine being involved in the interaction. The cognitive abilities this method requires (e.g., working memory and verbal skills) precludes

their use with certain groups, for example those who have suffered a brain injury. These concerns facilitated the development of BRAIN QUEST, a novel measure of social information processing. BRAIN QUEST is a computer-based measure that presents ambiguous social situations in video format. The participant is asked a series of open-ended questions which assess emotion regulation and the various stages of social information processing. The brief videos and accompanying questions can be completed by the participant without the researcher being present reducing the influence of social desirability. Psychometric properties for the measure will be presented based on normative data from over 60 normally developing adolescents. Measures of positive and negative social behaviours will be compared to information processing patterns as measured by BRAIN QUEST. A sample of adolescent boys ( $n = 15$ ) with a brain injury were compared to the normative group. Brain-injured adolescents reported greater feelings of anger, gave more aggressive responses and generated more socially inappropriate solutions to social problems. However, the brain injured group did not rate themselves as being more aggressive. These results suggest that the brain injured participants were unaware of their difficulties regulating negative emotions and believed themselves to be as socially skilled as their non-injured peers.

### **Emotion Regulation Following Traumatic Brain Injury: An Experimental Examination of Disorders of Control and Drive**

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Christopher John Hunt, Skye McDonald and Julie Henry

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**T**raumatic brain injuries (TBI) often lead to individuals experiencing difficulties with social and emotional processing. Two broad groups of disorders can be identified. These are disorders of control, characterised by impulsivity and aggressive behaviours, and disorders of drive, characterised by apathy, rigidity and lack of initiative. This study attempted to link neuropsychological deficits suggestive of these disorders and responses towards emotional stimuli. It also attempted to examine any differences between individuals with a TBI and those without in their use of emotion regulation strategies. 20 participants who had experienced a severe TBI and 20 matched control participants were shown video stimuli designed to induce anger. Participants were given instructions designed to engender the use of specific emotion regulation strategies whilst watching these stimuli. Participants were also given various neuropsychological tasks designed to examine cognitive markers of disorders of drive and of control. The results indicated that individuals who performed poorly on neuropsychological tasks examining impulsivity also showed an increased angry response to emotional stimuli. Conversely, those who exhibit deficits on a task of cognitive flexibility displayed a decreased sad response to the emotional stimuli. These findings complement and extend previous clinical work that examined disorders of control and drive through the use of questionnaires. With regards to questions about the use of specific emotion regulation strategies, the current findings were inconclusive.

## CONCURRENT SESSION 3: MEMORY AND EXECUTIVE FUNCTIONS

**Outcome for Older Adults Following Mild Traumatic Brain Injury: Impact on Prospective Memory**

Glynda Kinsella,<sup>1,2</sup> Brooke Froud,<sup>1</sup> Ben Ong,<sup>1</sup> John Olver,<sup>3,4</sup> Thomas Kossmann<sup>4,5</sup> and Linda Forlano<sup>6</sup>

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In young adults, mild traumatic brain injury (mTBI) is typically associated with neuropsychological recovery by 3 months postinjury. However, few studies have investigated outcome in older adults (> 65 years) and more persisting deficits may be expected. A sample of 96 older adults (22 moderate TBI, 27 mild TBI, 25 trauma controls, 22 community controls) were evaluated on a range of neuropsychological measures, including prospective memory, at 3 months posttrauma and followed up at 6 months via self-report questionnaires of everyday memory, and emotional status. At 3 months retrospective memory was equivalent across groups although all trauma groups ( $\pm$  TBI) demonstrated executive attention and processing speed impairments. Prospective memory separated both TBI groups from trauma and control groups suggesting the specific vulnerability of prospective memory post-TBI in older adults. By 6 months, everyday memory difficulties were reported by the moderate TBI group and predicted only by 3-month prospective memory and executive attention. The value of early neuropsychological assessment of prospective memory for predicting follow-up self-report of everyday memory difficulties by older adults will be discussed, including the challenges in developing reliable clinical measures of prospective memory.

**The Role of Executive Functions in Memory Processes: Verbal and Non-Verbal Learning Performance in Persons With Lateralised Frontal and Temporal Lobe Tumours**

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<sup>2</sup> *Department of Neurology, Royal North Shore Hospital, Australia*

This study investigated the contributions of frontal systems to memory and learning processes. Specifically the study examined whether the organisational and strategic aspects of the encoding process may be differentially more disrupted by left-sided frontal lesions than by right-sided frontal lesions, while the organisational and strategic aspects of the retrieval process may be differentially more affected by right-sided frontal lesions than by left-sided frontal lesions. The effect of providing external strategic and organisational structure during the encoding and retrieval stages of learning was also investigated. Fifty-eight patients with cerebral tumours (17 left frontal, 20 right frontal, 10 left temporal and 11 right temporal), and 20 healthy control participants were enrolled in the study. Participants were administered a verbal learning task and a non-verbal learning task under each of four experimental conditions to examine the effects of providing external organisational structure at various stages of the learning process.

There was no conclusive evidence that encoding and retrieval processes are differentially affected by lesions to the left or right frontal lobes, respectively. Furthermore, the results of the study did not support the expectation that patients with frontal lobe lesions would exhibit greater improvements in learning and recall performance than patients with temporal lobe lesions when comparing relative changes in baseline performance levels as a result of the provision of external organisational structure during the learning process. Several explanations for the findings are presented, and the implications for psychological rehabilitation following lesions to these brain regions are discussed.

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### **Protocol for a Randomised Controlled Trial to Assess the Success of Using PDAs to Compensate for Poor Memory After Brain Injury**

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Bronwyn McFarlane,<sup>1</sup> Belinda Armstrong,<sup>1</sup> Jeanine Allaous,<sup>1</sup> Natasha Lannin<sup>2</sup> and Robyn Tate<sup>2</sup>

<sup>1</sup> *Royal Rehabilitation Centre, Sydney, Australia*

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Prospective memory impairment is a common problem experienced by people following traumatic brain injury. Traditional rehabilitation has focused on facilitating people to successfully participate in daily activities through the use of compensatory methods including diaries. With improvements in technology, personal digital assistants (PDAs) are becoming increasingly common in the nonbrain-injured population. Anecdotal evidence also indicates that PDAs allow people with brain injuries to recall important information. This randomised controlled study aims to determine the effectiveness of using a PDA in improving functional independence in adults after acquired brain injury by compensating for poor prospective memory. Eligible participants are randomised to either a treatment or control group. The treatment group receives a PDA and training for an 8-week period. The waitlist/control group, receives standard intervention (e.g., diary or nonelectronic memory training) for 8 weeks followed by a PDA and training after this initial 8 weeks. All participants complete pre- and postmeasures at 0, 8, and 16 weeks including Goal Attainment Scaling, Memory Compensation Questionnaire and Rivermead Behavioural Memory Test and a Familiarity with Technology Questionnaire. Background information on each participant will also be collected at baseline. The study protocol will be discussed in addition to the training approach. Available results will also be discussed. This clinical trial is an evidence-based way to examine the effect of using PDAs routinely in cognitive rehabilitation after brain injury.

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### **Neuropsychological Perspectives of Disorder of Drive**

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Robyn L. Tate and Amanda T. Lane-Brown

*Rehabilitation Studies Unit, University of Sydney, Australia*

Characterological changes after frontal systems dysfunction have two main variants: disorder of control typified by the excesses in behaviour (e.g., disinhibition) and disorder of drive typified by the deficiencies (e.g., inertia). Measuring these impairments has been a challenge and previous work in traumatic brain injury (TBI) examined the capacity of neuropsychological variables to provide a direct and objective method of assessment. Using fluency tasks and factors from the Current Behaviour Scale, Tate

(1999) found evidence to support the use of rule-breaking errors to measure excesses in behaviour, but no evidence for reduced productive output to measure deficiencies. The present study had two main aims: (a) to re-examine the relationship between deficiencies in behaviour and productive output using the Apathy subtest of the Frontal Systems Behavior Scale (FrSBe-A), and (b) to analyse the relationship between time-on-task and productive output. The contribution of other cognitive and psychological factors was also evaluated. Twenty people with severe TBI were administered Thurstone's written word fluency (WF) test, along with other measures of cognitive functioning and psychological wellbeing. A modest correlation ( $r = 0.53$ ) was found between FrSBe-A and WF. Videotaped analysis of WF revealed that participants were actively engaged in the written execution of responses 36% of the time which was significantly correlated with productive output ( $r = 0.46, p < .05$ ). Results are discussed in the context of the contribution of data examining other cognitive and psychological factors.

#### CONCURRENT SESSION 4: COMMUNICATION ACCESSIBILITY FOR PEOPLE WITH A COMMUNICATION DISABILITY (SYMPOSIUM)

##### **Environmental Factors and People with Aphasia in the Community: Is the Current ICF Adequate?**

Tami Howe, Linda Worrall and Louise Hickson

*Communication Disability in Ageing Research Centre, School of Health and Rehabilitation Sciences, University of Queensland, Australia*

To date, much of the research on the environmental factors component of the International Classification of Functioning, Disability and Health (ICF) has concentrated on individuals with physical disorders, with few studies focusing on people with language disorders such as aphasia. The aim of the current research was to explore the environmental factors that hinder or support the community participation of adults with aphasia. This qualitative investigation involved two phases. In phase 1, semistructured in-depth interviews were conducted with 25 adults with aphasia. In phase 2, 10 participants from the first phase of the study were observed participating in community environments, using the method of participant observation. Results from the two studies revealed 181 barriers and 238 facilitators that influence the community participation of people with aphasia. Nine themes were also identified, including Awareness of Aphasia, Opportunity for Participation, Time Available for Communication, and Familiarity. The results suggest that the community participation of adults with aphasia is influenced by environmental factors in all five ICF environmental factor domains. The findings revealed, however, that some key areas such as the time available for communication and other people's awareness of an individual's health condition are not adequately addressed in the current ICF environmental factor component. Future versions of the ICF may need to consider incorporating some of these environmental factors into the classification system, in order to be relevant for people with aphasia.

## **Service Industry Workers' Perceptions of Barriers and Facilitators for People with Aphasia in their Community**

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Kyla Brown, Maram Al-Khaleedi, Denise Seah, Lesley McGahan, Linda Worrall and Tami Howe

*Communication Disability in Ageing Research Centre, School of Health and Rehabilitation Sciences, University of Queensland, Australia*

Within the World Health Organization International Classification of Functioning, Disability and Health (ICF), disability is recognised as an interaction between the individual's health condition and his or her personal and environmental factors. There has been little research identifying the environmental facilitators and barriers to participation for people with aphasia in the community. This study aimed to identify barriers and facilitators to community participation for adults with aphasia from the perspective of service industry workers. Eight focus groups were conducted with 24 service industry employees. Transcripts were analysed using qualitative content analysis procedures and barriers to and facilitators for participation of people with aphasia were identified. Three broad categories of barriers and facilitators were identified: (1) people environmental factors, such as people's awareness and assumptions about aphasia and their attitudes towards people with aphasia, (2) physical environmental factors, such as the use of written forms and technology, and (3) business or organisational environmental factors, such as the communicative demands of the business transaction, business attitudes and shop size. Service industry employees identified a range of barriers and facilitators for people with aphasia. Some of the more significant findings include the lack of awareness about aphasia, the willingness of service industry workers at the individual level to accommodate people with aphasia, and the difficulty in making the necessary system, policy, and procedural changes at the organisational level. Speech pathologists are encouraged to assist service industry providers to be more aphasia-friendly through education and training, in addition to assisting people with aphasia to become self-advocates.

## **Communicatively Accessible Public Transport for People With Aphasia**

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Catherine Ashton, Noor Aziziah Aziz, Caroline Barwood, Renee French, Elizabeth Savina and Linda Worrall

*Communication Disability in Ageing Research Centre, School of Health and Rehabilitation Sciences, University of Queensland, Australia*

There has been little research as to how society accommodates the communicative needs of people with aphasia. The accessibility of public transport becomes important post stroke and good communication skills are vital for successful travel. This research study aims to identify the communicative barriers and facilitators that exist when people with aphasia use public transport. The qualitative study used in-depth, semistructured interviews and observations with seven participants who presented with varied types of aphasia. Interviews were conducted pre- and postjourney. Observations were conducted throughout the journey chain, from planning the trip to arrival at destination. The most significant barriers to a public transport journey were within the category of Public Transport Services and Systems, most notably during transactions requiring verbal expression and where time constraints were at a premium. The most common facilitators were in the categories of Products and Technology for Communication (e.g.,

written materials) and Support from Other People. These findings suggest that the majority of communicative barriers for commuters with aphasia occur in circumstances when verbal communication is mandatory, or when rapid information processing is required. Additionally, people with aphasia employ many communicative facilitators. These have enabled them to travel successfully and need to be promoted to new users of public transport systems. This study highlights the need to address communicative aspects of accessibility within public transport systems.

## **Reintegration into Social Roles Following TBI: Teaching People to Communicate With Confidence**

Sue Sloan<sup>1</sup> and Jan Mackey<sup>2</sup>

<sup>1</sup> *Osborn Sloan & Associates, Melbourne, Australia*

<sup>2</sup> *Applied Communication Skills, Melbourne, Australia*

This paper will present a practical approach to teaching confident communication skills to support social role reintegration following traumatic brain injury. Decreased opportunities for meaningful occupation and role fulfilment, as well as social isolation, are the main long-term issues consistently reported in outcome studies. Changes in the number and quality of relationships are common and people with TBI spend more time alone and rely more on family for social contact. Research has also found that social integration may decrease over time after injury. The inability to maintain established friendships and form new social relationships may be traced to underlying cognitive-behavioural impairments and the associated loss of pragmatic language function. These social communication skills are often perceived by therapists as being difficult to teach. Further, the client's insight and awareness are often compromised and the family may have poor understanding of the nature of these difficulties. This paper outlines the six key principles of the Community Approach to Participation (CAP), which provide the framework for social communication skills training. Flexible learning pathways to build confidence in the core skills of listening, talking, greetings and partings, manners and extending social networks are described. The importance of systematically graded practice and the generalisation of skills into specific community roles is illustrated with a case study.

## **CONCURRENT SESSION 5: DEPRESSION AND BRAIN INJURY**

### **Post Stroke Depression: The Controversial Issues**

David Andrewes and Lianne Jenkins

*Department of Psychology, University of Melbourne, Australia*

This review of controversial issues of poststroke depression (PSD) first examines the incidence of depression in 20 studies to find that around a quarter of patients suffer clinical depression while the incidence varies according to the method of diagnosis and assessment. The influences of PSD on recovery rate and mortality are discussed within a context of research findings which are generally confirming but with some conflicting results. The research for any intermediary factors that may be causing this relationship is undeveloped at this stage. The issue concerning the contribution of brain damage undermining emotional systems is an area which at one time held much promise in resolving a neuropsychological issue concerning the

role of lateralised emotional systems in the production of depression is not supported in the case of stroke. It is argued that stroke with its often diffuse lesions may be a difficult model to test the existence of localised emotional substrates. Depression as a reaction to handicap also has indifferent support, but here the method used by studies often undermines the goals of understanding the patient's attitude to handicap. Finally, there is a review of psychosocial influences on depression. While it is well documented that psychosocial factors deteriorate following stroke and that this is associated with depression, the direction of causation is less certain. It is argued that there is actually bidirectional relationship in which depression and psychosocial factors interact. The final discussion describes future approaches to research which addresses these issues.

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### **An Investigation into Mood Induction and the Perception of Social Relationships in Depressed Stroke Patients: A Prerequisite for Therapeutic Change**

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Margaret Turner and David Andrewes

*Psychology Department, University of Melbourne, Australia*

The incidence of poststroke depression (PSD) is approximately 30% impacting on recovery, cognition and survival. Psychological therapy studies have produced mixed, but largely negative results and demonstrate the difficulty of working with patients with limited emotional and cognitive resources. This study investigates the potential of using a less cognitively demanding but empirically proven therapy called interpersonal therapy (IPT) and also looks at means to enhance the effects of this therapy. Since stroke patients present with different cognitive deficits depending on the side of the stroke, right and left stroke patients are differentiated and a group of rheumatic/orthopaedic patients are used as controls to eliminate the contribution of physical handicap. Experiment 1 assessed depression, mood, emotional and social function, humour, attitudes towards relationships, rumination and verbal and nonverbal positive mood induction using film clips. Experiment 2 assesses depression, mood, empathy, theory of mind, alexithymia, verbal and nonverbal fluency, memory and training in interpersonal exchanges using video clips of emotional scenarios. Positive mood induction significantly improved depression, mood and attitudes towards relationships despite cognitive and emotional processing deficits. There were significant effects of type of film and interaction effects of time and type of film for mood and attitudes. The nonverbal film significantly improved attitudes and mood in all patients. The verbal film only significantly improved mood in the right PSD patients. These results suggest IPT is a potential therapy for PSD and demonstrate the importance of modifying therapies to the cognitive abilities of patients.

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### **The Contribution of Pre-Existing Depression to the Acute Cognitive Sequelae of Mild Traumatic Brain Injury**

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M. H. W. Preece, Gina M. Geffen and Brooke K. Dougan

*Cognitive Psychophysiology Laboratory, School of Psychology, University of Queensland, Australia*

Frontotemporal abnormalities and cognitive dysfunction, especially in verbal memory and information processing speed, occur in both mild traumatic brain injury (mTBI) and depression. Study 1 investigated the effect of depression on cognitive performance in a sample at risk of sustaining mTBI.

Seventy-eight male undergraduates completed the Depression Anxiety Stress Scales (DASS), Digit Symbol Substitution Test (DSS), Hopkins Verbal Learning Test (HVLTL), and Speed of Comprehension Test. A one-way analysis of covariance (using the top 25% and bottom 25% of DASS Depression subscale scorers) showed that HVLTL recognition was significantly worse in the high scorers. Study 2 examined the effects of injury type and pre-existing depression on cognitive performance in a prospective emergency department sample (within 24 hours of injury). Fifty-eight participants with mTBI (29 with depression, 29 without depression) and 47 control participants (18 with depression, 29 without depression) completed the DSS, HVLTL, and Speed of Comprehension Test. Participants with mTBI performed worse than controls (uninjured and orthopaedic-injured participants) on all tests. Participants with depression did not perform worse than participants without depression on the tests. However, there was a significant univariate interaction for HVLTL recognition, participants in the mTBI group with depression exhibited worse recognition compared to participants without depression. Since word recognition was impaired in participants who were more depressed in both samples, this suggests that it is a consistent finding. More importantly, the results of Study 2 indicate that depression may interact with mTBI to impair word recognition during the acute phase after head injury.

### **Subjective Complaints of Depression: A Comparison of Stroke and Amputee Patients**

L.M. Jenkins,<sup>1</sup> D.G. Andrewes,<sup>1,2</sup> T. Hale,<sup>2</sup> F. Khan,<sup>2</sup> N. Coetzee<sup>1</sup>  
and N. Lincoln<sup>3</sup>

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<sup>2</sup> *Rehabilitation Unit, Royal Park Campus of the Royal Melbourne Hospital, Australia*

<sup>3</sup> *Nottingham University, United Kingdom*

Depression is a common condition following stroke and amputation, and understanding the phenomenology of depression is important since it has been found to undermine attempts at rehabilitation. This study is aimed at identifying the factors which contribute to depression according to the patients' own self-report. Twenty-seven stroke patients and 25 partners of stroke patients and a comparison group of 28 amputees and 24 partners of amputee patients were sampled from a rehabilitation centre. Participants were assessed for depression according to the Hospital Anxiety and Depression Scale, the General Health Questionnaire-28, and the Emotional and Social Dysfunction Questionnaire. In addition the Subjective Depression Questionnaire was developed to investigate the roles of various perceived deficits in the development of depression including communication, cognitive functioning, physical functioning, emotional dysfunction, concerns about the future, concerns about finances, social functioning, changed in life roles, and relationships. Stroke patients scored higher than amputee patients on all depression measures. The scales of the SDQ were used to predict a combined depression score in a stepwise regression for each group. For the stroke group, the cognitive difficulties scale was the first to enter the model, ( $R^2 = .53$ ). The addition of the emotional dysfunction scale increased the  $R^2$  to .68. For the amputee group, the relationships scale was the only scale to enter the model ( $R^2 = .41$ ). This study identifies target areas that are important for the development of therapeutic interventions for these patients. For stroke patients in particular, an intervention should target the morbid reaction to cognitive deterioration and emotionalism.

## CONCURRENT SESSION 6: MEASUREMENT OF TBI/ABI OUTCOMES

**Rivermead Post-Concussion Symptoms up to 12 Months Post-TBI: Effects of Age, Sex and PTA**

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Phillipa Cannan, Clive Skilbeck and Mark Slatyer

*School of Psychology, University of Tasmania, Australia and Royal Hobart Hospital Neurotrauma Register*

**A**lthough TBI is common, its sequelae are poorly understood. A factor analysis of the Rivermead Post Concussion Symptoms Questionnaire (RPCSQ) yielded four symptom areas: emotional, cognitive, physical and visual. The study's aim was to examine the relationships of age, sex, and PTA to RPCSQ factor symptomatology in the 12 months following injury. A population sample of 431 individuals who presented with TBI at the Department of Emergency Medicine, Royal Hobart Hospital participated. Data were collected on the RPCSQ, at six time points (soon after injury, and at 14 days, 28 days, 3 months, 6 months, and 12 months post-injury). One-way ANOVAs were conducted on RPCSQ factor scores at separate cross-sectional time points, and Repeated Measures ANOVAs were employed for adjacent time points, using sex, age group, and TBI severity as independent variables. As predicted, females reported more symptoms on the factors over the 12 months. Contrary to previous research, individuals aged 41 to 60 years reported the highest symptomatology, with participants over the age of 60 reporting the fewest. Participants with longer PTAs consistently reported more symptoms throughout the 12 months. While the results for sex and PTA were expected (the latter confirming its validity as a predictor of TBI outcome), the finding of more symptoms in middle-aged participants was surprising (perhaps attributable to the compounding effects of other life stresses). This research should help clinicians better understand how age, sex and PTA affect recovery patterns following TBI, and assist them in planning appropriate treatment interventions.

**The Factor Structure of the Hospital Anxiety and Depression Scale (HADS) in a TBI Population**

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Kieran Holm, Clive Skilbeck and Mark Slatyer

*School of Psychology, University of Tasmania, Australia and Royal Hobart Hospital Neurotrauma Register*

**P**revious research has suggested both 2- and 3-factor models for the HADS, although its structure has not been investigated in TBI. The present study undertook such an investigation, and also examined the relationships of age, sex, and PTA to the factors identified in the 12 months following injury. Exploratory and confirmatory factor analyses were conducted with a population sample of TBI. 371 individuals who presented with TBI at the Department of Emergency Medicine, Royal Hobart Hospital participated. Data were collected on the HADS factors at six time points (soon after injury, and at 14 days, 28 days, 3 months, 6 months, and 12 months post-injury). One-way ANOVAs were conducted on factor scores at separate cross-sectional time points, and Repeated Measures ANOVAs were employed for adjacent time points, using sex, age group, and TBI severity as independent variables. Confirmatory factor analysis indicated a 3-factor structure for the HADS (anxiety, depression, psychomotor). As predicted, females produced higher scores on the three factors over the 12 months. Participants in the age group 41 to 60 years reported higher levels of problems on the three factors. Participants with longer PTAs reported more

symptoms over the 12 months. Whilst the results for sex and PTA were predicted, the finding of higher factor scores in middle-aged participants was not expected. This research should help clinicians better understand how age, sex and PTA affect mood factors and their recovery following TBI, and also assist them in planning appropriate treatment interventions.

### **Patterns of Cognitive Impairment in the Longer Term After Severe Traumatic Brain Injury: A Multi-Centre Study**

R.M. Schultz, R.L. Tate, I.C. Cameron and B.M. Myles

*Rehabilitation Studies Unit, University of Sydney, Australia*

Despite the large volume of research investigating outcome after traumatic brain injury (TBI), few studies have examined the number of different types of impairments at the individual level. Consequently, there remains limited knowledge of the pattern of recovery across different domains of cognitive function. The aim of the present study is to follow individual patterns of recovery from severe TBI across three time periods. Participants were an inception cohort taken over 2 years from 11 rehabilitation centres in the NSW Brain Injury Rehabilitation Program. Five cognitive items from the Mayo-Portland Adaptability Inventory (MPAI) were used to examine functioning in the domains of communication, memory, attention, problem-solving and visuospatial abilities. Participants were measured at rehabilitation admission, 18 and 36 months postinjury. Those participants with a PTA greater than 4 weeks ( $n = 68$ ) were examined. Findings suggest that if individuals are impaired it is likely that this will be a multifocal picture; 78% had 3 or more domains impaired at rehabilitation admission. The characteristic pattern of impairment was in memory, attention and problem solving abilities, with 94-100% of those with multi-focal impairment having this combination across the three time points. These impairments remain at a clinically significant level, with 80% of those with impairments at rehabilitation admission still impaired at 18 and 36 months post injury. A characteristic pattern of recovery within domains and across time periods emerged, specifically, within the domains of memory, attention and problem solving. These results are discussed in light of implications for cognitive rehabilitation.

### **People with ABI With High Care and Complex Needs: Factors in a Living Environment That Impact on Health and Wellbeing**

Dianne Winkler,<sup>1</sup> Louise Farnworth,<sup>1</sup> Sue Sloan<sup>2</sup> and Ted Brown<sup>1</sup>

<sup>1</sup> *Monash University, Australia*

<sup>2</sup> *Osborn Sloan & Associates*

There are about 3500 people under 60 years of age residing in aged care facilities in Australia. Of these, more than a quarter (about 1000) are younger than 50 years and 37% have an acquired brain injury. Residential aged care facilities are designed to provide accommodation, personal and nursing care to frail older people at the end stage of their life. People under 60 living in aged care facilities are at risk of occupational deprivation and the loss of their already limited abilities through lack of use. In February 2006, the Prime Minister announced a \$244 million COAG initiative, which will enable some younger people in residential aged care to make the transition to more appropriate accommodation and support. This initiative has the potential to make a tremendous difference to the lives of a group of people who

are effectively excluded from participating in our society. However, research which has examined the outcomes of deinstitutionalisation of other disability groups indicates that moving people from an institutional setting to community based housing alone does not guarantee a marked improvement the health and well-being of consumers. This paper will present a model for examining the health and wellbeing of younger people with high care needs and the factors in a living environment that impact on their health and well being. This model will provide a framework for assessment and intervention for younger people with ABI either living in residential aged care or at risk of placement in an aged care facility.

## CONCURRENT SESSION 7: PAEDIATRIC TBI (SYMPOSIUM)

### **Assessment of Posttraumatic Stress in Children With Traumatic Brain Injury**

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Belinda Murray,<sup>1</sup> Justin Kenardy,<sup>1</sup> Robyne Le Brocque,<sup>1</sup> Vicki Anderson<sup>2,3</sup> and Lynne McKinlay<sup>4</sup>

<sup>1</sup> *University of Queensland, Australia*

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<sup>3</sup> *Murdoch Children's Research Institute, Australia*

<sup>4</sup> *Queensland Paediatric Rehabilitation Service, Australia*

**A**ssessment of posttraumatic stress disorder (PTSD) after traumatic brain injury (TBI) is complicated, as there is considerable overlap between symptoms of TBI and PTSD, in particular in the domains of arousal (irritability, difficulty concentrating and sleeping problems), and memory (dissociation and intrusions). This can present problems for differential diagnosis in TBI patients. The complexities surrounding differential diagnosis of PTSD have clearly hampered development of knowledge in this field. Using data from the prospective study of cognitive impairment and posttraumatic stress symptoms in children with TBI, this paper examines some of the methodological issues surrounding diagnosis and classification of PTSD symptoms in children 8 weeks after TBI. The Clinician Administered PTSD Scale for Children and Adolescents (CAPS-CA) is a structured clinical interview schedule that provides child-reported diagnostic information about symptoms of post traumatic stress disorder. The Trauma Symptom Checklist for Children (TSCC) is a self-report measure of posttraumatic stress related psychological symptomatology and is completed by the child. Using both the above instruments, rates of symptomatology and agreement between instruments will be examined. The implications of the use of these instruments for clinical practice with children with TBI will be discussed.

### **Behavioural Differences Before Traumatic Brain Injury: Is There a Differential Injury Risk?**

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Katherine Olsson and Justin Kenardy

*University of Queensland, Australia*

**S**tudies have indicated that children who sustain traumatic brain injuries (TBI) may experience poorer behavioural and social functioning post-injury, however, at present it is unknown if the behavioural and social functioning of children who sustain a TBI differs from children in the general population. The aim of this study was to investigate the premorbid functioning of children who sustain a TBI. Specifically, this study investigated the

relationship between behaviour, social competence, and TBI severity. Children aged 6 to 14 years, with mild and moderate/severe TBI were recruited from hospitals in Brisbane and Melbourne, between April 2004 and December 2006 as part of a wider longitudinal study. Parents completed the Child Behavior Checklist (Achenbach, 1991) and a semistructured interview using the Vineland Adaptive Behavior Scales (Sparrow, Balla, & Cicchetti, 1984) to assess preinjury behavioural and social functioning within 3 months of their child's injury. Preliminary results show that children with TBI are no more likely than the general population to have clinical levels of behavioural problems before their injury but may, in fact, have lower rates of anxiety and depression. No differences have also been observed in children with mild TBI compared to moderate and severe for pre-injury behavioural problems or social competence. The findings of the study are discussed in terms of clinical, policy, and research implications.

### Attention Deficits in TBI and PTSD

Rian Dob,<sup>1</sup> Justin Kenardy,<sup>1</sup> Vicki Anderson,<sup>2,3</sup> and Lynne McKinlay<sup>4</sup>

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<sup>4</sup> *Queensland Paediatric Rehabilitation Service, Australia*

It is well-established that traumatic brain injury (TBI) in children is associated with a range of cognitive deficits that may result in residual impairments. Using data from the prospective study of cognitive impairment and post traumatic stress symptoms in children with TBI, this paper will focus on attention as a central concept in cognitive functioning. Three-month assessment of attention skills in the research participants will be discussed, exploring the utility of a continuum approach of attentional deficits from the acute to the longer-term stages of brain injury. Mirsky's model of attention will be used to discuss various brain regions thought to be implicated in attention deficits after TBI and this will be compared with those areas identified in neuroimaging studies in individuals with posttraumatic stress disorder.

### Return to School Following TBI: Adolescent Insiders' Perspectives

Margaret Mealings<sup>1,2</sup> and Jacinta Douglas<sup>2</sup>

<sup>1</sup> *Epworth Healthcare, Victoria, Australia*

<sup>2</sup> *La Trobe University, Victoria, Australia*

Sustaining a traumatic brain injury (TBI) as an adolescent has implications for the transition back to the school environment. In the literature to date there is a wide range of studies that provide clinicians with information regarding incidence, common outcomes, impact on family functioning and recommendations on assisting students in their return to school. The aim of this project was to hear the stories of three male adolescent students as they reflected on their own experiences of what it was like to go back to secondary school after sustaining a severe TBI — an area not reported in the literature. Using a qualitative research design and in-depth interviews, the student's stories were transcribed and coded using grounded theory principles. Following this interpretation, a tentative model was developed to guide clinical practice. Despite their persisting communication difficulties, the students were able to provide rich stories indicative of their personal experiences. Seven predominant themes emerged from the interviews: the role of school in student's lives,

changes experienced in their school life, changes to self, descriptions of their feelings, the reactions of others to the students' return to school, supports and interventions provided, and educational and vocational goals of the students and how these were influenced by their injuries. The proposed model that emerged from the students' perspectives shows a three-way interaction between the student and their 'sense of self', the changes resulting from the injury and the supports provided. It is anticipated that this model will assist clinicians and educators in developing a holistic picture of the student's school participation at any time, responding to the constant change which may occur in the student's life.

## CONCURRENT SESSION 8: ABI: APPLIED ISSUES

### **Internet Usage by TBI Survivors: A Useful Social Technology or a Threat to Social Participation**

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Jennifer Egan

*School of Social Work and Applied Human Sciences, University of Queensland, Australia*

**T**raumatic brain injury (TBI) survivors report loneliness and social isolation as their greatest burden and rehabilitation systems are challenged to address the enduring psychosocial needs of survivors. The Internet is a controversial social technology which has transformed the way we communicate. Yet there is concern that overuse of the Internet by marginalised people may further increase social isolation. This study conducted email-facilitated qualitative interviews with 19 TBI survivors. Participants answered questions about Internet usage patterns and social isolation. Participants report email as the most used Internet activity. They say that email usage assists in decreasing social isolation and promotes participation in daily life. The asynchronous nature of email communication also assists communication for participants with cognitive-linguistic impairments. Participants convey awareness of potential dangers posed by Internet usage and suggest preventative strategies. Face-to-face interaction is valued over email communication. This study concludes that the internet is a useful assistive communication technology which decreases social isolation and assists psychosocial rehabilitation. Concerns regarding internet addiction are challenged.

### **Issues of Capacity in a Legal Setting**

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Matthew Holmes

*MurphySchmidt Solicitors, Queensland, Australia*

**T**he paper discusses the varying legal issues facing persons suffering an acquired brain injury, in particular, the different tests of capacity as legally defined by legislation. It highlights the conflicting degrees of capacity required and the consequent effects that this has on a person's rights. Practical examples are addressed, including applications before the Guardianship and Administration Tribunal, applications for declaration of capacity before courts, issues affecting powers of attorney and succession planning, criminal law, contractual relationships, and marriage. The inadequacy of the Mini Mental State Examination (MMSE) and its heavy reliance by general medical practitioners in assessing a person's capacity for legal purposes is addressed. Crude examinations which are culturally insensitive and reliant on a person's general fund of knowledge are not of assistance in

the determination of a person's capacity. We conclude that a more useful approach is to obtain anecdotal evidence from the person's support network regarding their ability to function in every day life subsequent to the acquired brain injury and place that in context with the medical assessment of the person's impairment of cognitive functioning.

## **'I just want to go home': Neuropsychologists' Experiences of Decision-Making Capacity Assessment in a Public Hospital Setting**

Joanne Oram, Helen Tinson and Dale Fogarty

*Princess Alexandra Hospital, Brisbane, Australia*

**D**emand for neuropsychological opinion regarding an individual's decision making capacity has increased in association with changes in both population demographics and the legislative climate. This paper reports on the experiences of neuropsychologists conducting assessments of decision-making capacity within a public hospital setting, with emphasis on the extent to which neuropsychological opinion (a) concurred with that of other members of the treating team and (b) was taken into consideration in patient management. Over a 3-year period, 41 males and 23 females ranging in age from 17 to 88 years were assessed. Approximately half presented with either acquired brain injury or neurological illness, and the remainder with a variety of other medical conditions. Requests for an opinion about a patient's capacity to make decisions regarding their living arrangements following discharge from hospital were the most common (29 cases), followed by capacity to assign an Enduring Power of Attorney (19), capacity to manage finances (12), and capacity to make specific health care decisions (5). Neuropsychological opinion of a patient's decision-making capacity differed from that of other members of the treating team in approximately 20% of cases. This was more likely to be the case in relation to patients' capacity to make decisions about their living arrangements and when the implications of neuropsychological opinion conflicted with the availability of hospital and/or community resources. Neuropsychological opinion tended to be valued and incorporated in patients' care plans to a greater extent when the neuropsychologist conducting the assessment was part of the patient's multidisciplinary treating team in contrast to when the neuropsychologist acted as a consultant on another ward. Implications for future practices that both maximise patient's autonomy and fulfil duty of care obligations are discussed.

## **Cognitive and Behavioural Processes Underlying Performance on On-Road Driving Assessments**

Janelle Griffin,<sup>1</sup> Nicole Weir<sup>1</sup> and Jennifer Fleming<sup>1,2</sup>

<sup>1</sup> *Princess Alexandra Hospital, Brisbane, Australia*

<sup>2</sup> *University of Queensland, Australia*

**O**ften people who have sustained a traumatic brain injury (TBI) have residual deficits that impair driving performance. Neuropsychological recovery may continue for several years after injury. Consequently, choosing the appropriate time to assess the driving abilities of a person with a TBI is difficult. Research identifying predictors of driving ability or indicators of readiness to undergo driving assessment currently does not provide health professionals with enough information to make decisions about referral. This study aims to identify the cognitive and behavioural processes that contribute

to failure of driving assessments by people with TBI. Thirty people with a TBI who have had an on-road driving assessment in a selected 4-year period were identified from the occupational therapy driving assessment database at the Princess Alexandra Hospital. Participants were categorised into groups of those who passed and those who failed the assessment. Qualitative analysis of de-identified occupational therapy driving assessment reports is used to describe the cognitive and behavioural processes responsible for driving performance. Frequency counts of the various issues identified in the reports, and comparison of data between those who failed and those who passed is recorded and will be presented. Knowledge of factors related to the failure of on-road driving assessments could help health professionals with their decision making and also allow the screening of referrals to ensure that only people ready to attempt driving are referred for assessment.

## CONCURRENT SESSION 9: PREDICTORS AND OUTCOMES OF BRAIN INJURY

### Long-Term Impact of Childhood Traumatic Brain Injury on Socio-Emotional Functioning

Celia Godfrey,<sup>1,2,3</sup> Vicki Anderson,<sup>1,2,3</sup> Cathy Catroppa<sup>1,2,3</sup> and Sandra Brown<sup>1,2,3</sup>

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<sup>2</sup> Murdoch Children's Research Institute, Australia

<sup>3</sup> Royal Children's Hospital, Melbourne, Australia

Children who suffer traumatic brain injury (TBI) are at risk of long-term consequences across a range of domains including physical, cognitive, behavioural, social, and psychological aspects of development. Standard treatment follow-up for this group to date has been limited, although this is now changing with the development of new rehabilitation programs. Over the past 10 years our team has been tracking a group of 96 children who sustained a head injury before the age of 8 and presented to the Emergency Department of the Royal Children's Hospital, Melbourne. This presentation will outline the prospective study and then discuss the 6th wave of data collection, which is currently under way. In particular, the extensive Neuropsychological test and questionnaire battery will be considered. Some preliminary results will be presented, focusing on social outcomes — an emerging area of importance in childhood TBI research and rehabilitation. Several brief case studies will illustrate potential developmental trajectories for this group and highlight the need for rehabilitation or other intervention.

### Are Compensated Interventions or Hospital-Based Programs the Key to Minimising Long-Term Psychological Deficits in Children with a TBI?

Sandra Brown,<sup>1,2</sup> Heidi Newitt<sup>3</sup> and Vicki Anderson<sup>1,2,4</sup>

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Traumatic brain injury (TBI) in childhood occurs at an annual rate of 250 cases per 100,000 children from incidences such as falls, sports and motor vehicle accidents. Historically, children's brains were thought to recover well from TBI without long-lasting problems. However, recent research argues that the severity of the injury, injury age and preinjury factors

such as developmental problems, impact on long-term success in the psychosocial domains of education, relationships and daily functioning. Children with TBI fall into either the compensated (typically ensuring ongoing availability and designated coordination of services) or noncompensated category (generally utilising services offered by the hospital or funded by the family). This study aimed to identify the existence of psychosocial deficits in the long-term post-TBI, and to investigate whether the compensated and noncompensated groups differed in their outcomes. Using a longitudinal design and questionnaire responses from adults who sustained TBI before the age of 16, the study compared the types and frequency of interventions used by 53 compensated MVA participants to those used by 72 non-compensated participants. Preliminary results suggest that regardless of compensated interventions being available, this did not improve psychosocial outcomes in adulthood. Children and families may benefit from structured, ongoing rehabilitation programs until early adulthood.

### **A Systematic Review of Rehabilitation for the Upper Limb After Brain Injury: Searching for a Magic Bullet**

Natasha A. Lannin

*Rehabilitation Studies Unit, University of Sydney, Australia*

Who would not rejoice to find a magic bullet that we could use to give people independent arm movement after brain injury? Approximately 70% of people with brain impairment experience hemiplegia and an estimated 48% to 95% of people never regain functional arm or hand use. This loss of hand use is particularly devastating as everyday activities of life become uniquely challenging. A systematic review was conducted to determine the evidence for upper limb rehabilitation and provide clinical guidance for therapists working in traumatic brain injury (TBI) rehabilitation. Six electronic databases were searched and reference lists of relevant studies were reviewed to identify further trials. Each paper was critically appraised and summarised, and randomised controlled trials used to determine efficacy. PEDro scale was used to determine the quality of trials located. Despite an increase in treatment intervention studies during the past 10 years, there is no consensus regarding 'best practice' for the rehabilitation of the upper limb after TBI. This review will demonstrate that there is evidence to support specific rehabilitation techniques, such as electrical stimulation and engaging the client in repetitive practice. Furthermore, it will show that many common complications that occur in the upper limb after TBI may be prevented. Although there is no 'magic bullet', research exists which is useful in guiding upper limb rehabilitation intervention after traumatic brain injury. Diverse clinical practice means that there is a range of disparity between accumulated evidence and clinical practice. This paper will provide suggested ways forward for both clinicians and researchers in the area.

## Determinants of Cognitive Complaint After Transient Ischaemic Attack and Lacunar Infarction

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**M**eta-analytic evidence of subjective complaint amongst older people suggests a community prevalence of between 25% and 50%. We investigated the relationships between subjective cognitive complaint, objectively assessed cognitive function, mood, and personality factors in 19 lacunar infarct (LI) and 18 transient ischaemic attack (TIA) participants. All participants were administered a battery of neuropsychological tests examining various functions, a questionnaire investigating their cognitive complaint, and questionnaires assessing depression, anxiety, and personality. The groups did not differ in their tendency to complain of cognitive difficulties since their cerebrovascular event, with 97% of participants reporting a perceived decline in their cognitive capabilities postevent. Complaint was differentially associated with cognition and demographic variables as a function of group membership. The LI group's complaint was most strongly associated with learning and working memory in a negative direction. The TIA group's complaint, however, was unrelated to cognition. Rather, a strong positive relationship emerged between complaint and years of education. These relationships were not mediated by age. Generally, LI and TIA participants did not differ in performance on cognitive tasks, nor in levels of neuroticism, anxiety, and depression. Both groups, however, underperformed on a measure of information processing speed compared with norms. Neuroticism, depression, and anxiety did not influence the degree of complaint reported. This is the first study to the authors' knowledge investigating subjective complaint in LI and TIA populations. These findings suggest these patients have strong concerns about cognitive deterioration after the cerebrovascular event, which may reflect reduced information-processing abilities and which cannot be explained by mood and personality factors.

## CONCURRENT SESSION 10: ASSESSMENT OF FUNCTIONS AFTER BRAIN INJURY

### Ecological Assessment of Information Processing Impairment in Men With HIV-Related Neurocognitive Impairment

J. Ranka and C. Chapparo

*School of Occupational Therapy, University of Sydney, Australia*

**A** common and clinically important complication of HIV/AIDS is neurocognitive impairment. Although neuropsychological profiles of this impairment have been developed, little is known about the exact impact on the functional capacity of people as they perform meaningful everyday tasks in typical performance contexts. The purpose of this study is to identify and describe the impact of cognitive impairment on task performance in real-world contexts in men diagnosed with HIV/AIDS using an ecological measurement model. Thirty men between the ages of 25 to 55 are being assessed in a home or community context performing two self-selected tasks that pose difficulty and are desired goals. The instrument being used is the Perceive, Recall, Plan and Perform (PRPP) System of Task Analysis. The PRPP

System is a reliable, criterion-referenced instrument that is used to measure task performance and the information processing operations that interfere with performance. Task performance is measured against expected levels according to set criteria. Information processing is assessed through the use of behavioural *descriptors*. Descriptors represent observable dimensions of information processing operations. Performance of each descriptor is scored according to the degree to which that behaviour impacted on task performance. The results of this study are being analysed using traditional statistical models as well as Rasch analysis methods, and will be presented in this paper. Identifying the impact of cognitive impairment on real-world performance of tasks using an ecological measurement model will enable occupational therapists to more specifically tailor therapy to the individual performance needs of clients as they live and age with HIV/AIDS.

### **The Use of Virtual Reality in Assessment of Executive Function Following Traumatic Brain Injury**

Belinda Renison,<sup>1</sup> Jennie Ponsford,<sup>1</sup> Renee Testa<sup>1</sup> and Askok Jansari<sup>2</sup>

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Existing neuropsychological measures show limited capacity to detect executive dysfunction in some people with traumatic brain injury (TBI). Virtual reality paradigms have the potential to capture executive dysfunction in a more ecologically valid, sensitive and cost-effective manner. This study aimed to investigate the sensitivity and ecological validity of the Virtual Reality Office Task (VROT; Jansari, Agnew, Akesson, & Murphy, 2004), a new measure of executive dysfunction. Twenty TBI participants with reported executive problems and 20 controls matched for age, gender and educational background completed the VROT and 4 neuropsychological measures of executive function (Brixton Spatial Anticipation Test, Verbal Fluency, Modified Six Elements test, Zoo Map task). Significant others rated everyday executive function on the Dysexecutive Questionnaire (DEX). Results indicated that the groups did not differ significantly on measures of IQ or verbal memory. Despite the TBI group experiencing significantly more everyday executive problems than the control group, the groups did not differ significantly on performance on three of the four neuropsychological assessments of executive function, namely the Brixton Spatial Anticipation Test, the Verbal Fluency Test and the Zoo Map task. The TBI participants did perform significantly more poorly on the Modified Six Elements Test. Importantly after controlling for IQ, verbal memory, education and performance on all of the neuropsychological measures of executive function, the TBI group performed significantly worse on the VROT than controls. This suggests that the VROT may have captured more complex aspects of executive dysfunction than the neuropsychological measures. Along with the Modified Six Elements Test, the VROT significantly predicted DEX scores, contributing unique variance. These findings support the use of the VROT as a sensitive and ecologically valid measure of executive function. Further psychometric research of the VROT is required.

## Increased Trunk and Centre of Pressure Motion in Brain-Injured Adults Under Challenging Postural Conditions

Sandra Brauer,<sup>1</sup> Brooke Hoskin,<sup>1</sup> Emma Leyland,<sup>1</sup> Jan Jasiewicz<sup>2</sup> and Peter Condie<sup>2</sup>

<sup>1</sup> *Division of Physiotherapy, University of Queensland, Australia*

<sup>2</sup> *Department of Human Movement Studies, Queensland University of Technology, Australia*

Clinically, poor trunk control is suggested to contribute to poor postural stability after an acquired brain injury, however there is little evidence to support this. The aim of this study was to investigate if centre of pressure (COP) and trunk motion during a challenging balance task were altered and related in people with an acquired brain injury, and if these differences were more pronounced when performing a concurrent cognitive task. COP motion measured via a force platform and 3D trunk motion at T3 and S2 measured with wireless motion sensors were recorded in 11 subjects with an acquired brain injury and 22 healthy young adults during a 30s tandem stance task. Correct verbal response rate to a concurrent auditory choice reaction-time task was measured. Brain-injured adults demonstrated greater COP distance, amplitude and velocity but not frequency than controls. The range and angular velocity of trunk motion was greater in brain injured than controls in the yaw (rotation) and roll (lateral flexion) planes at T3. COP distance was moderately correlated with trunk motion at T3 and S2. There was no change in COP or trunk motion with a concurrent task. A tandem stance position was sufficiently challenging in brain-injured adults to reveal an increase in trunk motion and COP excursion compared with controls. Our results support the suggestion that poor trunk control may contribute to poor postural stability and indicate that trunk control should be considered when assessing and retraining postural stability in this population.

## Measuring Task Embedded Information Processing During Task Performance

Melissa Nott and Christine Chapparo

*Faculty of Health Sciences, University of Sydney, Australia*

This presentation reports on the application of Rasch analysis to data derived from the Perceive, Recall, Plan and Perform (PRPP) System of Task Analysis; a standardised, criterion referenced assessment developed for occupational therapists to assess cognitive information processing through task analysis methods. Data has been collected from adults from eight trained occupational therapists who viewed video footage of occupational therapy sessions with adults following traumatic brain injury. Therapists scored performance using the standardised scoring procedures and assessment forms. Client performance was assessed during performance of functional tasks in the hospital environment. Tasks were selected according to the person's level of ability at the time of assessment, the person's life roles and environmental influences. Rasch analysis has been effectively used to create a linear continuum of item difficulty measures and person ability measures. The hierarchical ordering of items conforms to the hypothesised order of skill acquisition based on an information-processing model, and demonstrates goodness-of-fit with the Rasch model. Items and person demonstrate excellent separation reliability. Rasch analysis methods have provided an effective way to analyse the type of data commonly collected in clinical situations by occupational therapists. When applying Rasch analysis, the individuality of each client is maintained within the larger sample; however, entire samples can also be examined using group based measures. This ensures the results can be immediately applied to the clinical setting and assist in directing intervention.

## CONCURRENT SESSION 11: TBI: PSYCHOLOGICAL ISSUES

**Coping with Communication Breakdown After Severe Traumatic Brain Injury**

Amy Muir and Jacinta Douglas

*La Trobe University, Australia*

Communication breakdown, or the insufficient transmission of conversational messages, occurs frequently for people with traumatic brain injury (TBI). The ability to cope with communication breakdown has been linked with communication outcome and social participation. Recently, a new tool, the Communication Coping Questionnaire (CCQ), has been developed to measure communication-specific coping. The aim of the current study was to make a preliminary evaluation of the ability of the CCQ to identify differences between the communication-specific coping strategies used by adults with TBI and those used by matched controls. Nine adults with severe TBI were matched with nine controls on the variables age, gender and education level. All participants were administered the CCQ. The CCQ has two subscales, one measuring coping responses used in situations characterised by poor message transfer (expression) and the other measuring responses used in situations characterised by difficulties understanding (comprehension). Both subscales have been found to have acceptable internal consistency and test-retest reliability. *T* tests were applied to subscale total scores to identify whether statistically significant differences were present between the two groups. The TBI group obtained significantly lower total scores on the receptive and expressive subscales of the CCQ. They also used a significantly smaller range of coping strategies and a higher rate of nonproductive coping strategies than the matched controls. Adults with severe TBI exhibit a pattern of coping with communication breakdown that deviates markedly from that which is seen in the normal population. These differences are likely to have a negative impact on psychosocial outcomes.

**'I don't like being alone, when I'm alone I get sad thinking about life': Talking About Life After Severe TBI**

Jacinta Douglas

*La Trobe University, Australia*

Conceptualisations and correlates of quality of life and life satisfaction after traumatic brain injury (TBI) have been investigated by an increasing number of researchers in the last decade. The aim of this study was to explore the experience of life after TBI from the perspective of adults who were living with the long-term consequences of severe injury. Eighteen adults (16 men, 2 women; mean age 35.6, *SD* 9.5) all of whom had sustained extremely severe brain injuries (posttraumatic amnesia > 4 weeks) more than 5 years ago (mean time post injury 11.1, *SD* 4.1) participated in the study. Participants were interviewed in their own home setting using a semi-structured interview format. Interviews were recorded and transcribed. Quotes were coded and analysed using principles of grounded theory. When describing themselves, participants did not characterise themselves as *injured* or having had an *injury*. Rather they talked about aspects of their personalities (*I'm sociable and talkative; easygoing; honest and caring*) and personal likes and dislikes (*love music; like motorbikes, golf and fishing; love animals and nature*). Life after injury was dominated by two major themes in the participants' stories: *being involved* and *having friends*. It is

certainly not surprising that being active or involved and having friends emerged as highly valued aspects of life for people with TBI — they are important aspects of life for all of us. More importantly however, these findings serve to emphasise the need to focus rehabilitation efforts on developing skills and systems that promote positive outcomes in these areas.

## **The Family's Positive Experience: After a Member Sustains a Traumatic Brain Injury – What Makes the Difference**

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Helen Harrington

*Epworth Healthcare, Australia*

*Bouverie, La Trobe University, Australia*

There has been a growth of attention over the past decades investigating the family's functioning when a family member suffers a traumatic brain injury (TBI). Research has identified family members may experience feelings of stress, burden, anxiety and depression. Yet not all family members are negatively impacted by this event. Recent studies have demonstrated two thirds of families were not depressed. What factors have contributed to these family's positive outcomes is not known. The question of what assists family members to positively adapt after a relative suffers a TBI is explored in the following qualitative research project. Twelve family members, from differing families, were assessed as not suffering from clinical levels of depression or anxiety. These family members then participated in a focus group interview. Following the principles of grounded theory thematic analysis of the interviews was completed. The study identified family members used a mixture of methods to maintain their family's functioning. Many built upon skills they had developed when dealing with past family events of loss and trauma. Each described the importance of *relationships* and making connections with positive people. Central to their process of adapting was the family members' ability to *maintain hope*, and held the belief their relative had been given a second *chance to live*. The family members demonstrated a *resilience* to deal with what life had unexpectedly confronted them with. The paper aims to highlight what family's describe helped them. This information will help guide the field in how best to provide services to assist family members achieve positive outcomes.

## **Psychiatric Disorders Following Traumatic Brain Injury**

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Rochelle E. Whelan-Goodinson,<sup>1</sup> Jennie Ponsford<sup>1,2</sup> and Fiona Grant<sup>1</sup>

<sup>1</sup> *Monash University, Australia*

<sup>2</sup> *Monash-Epworth Rehabilitation Research Centre*

Following traumatic brain injury (TBI), high frequencies of depression, anxiety and substance use disorders have been found. However, no known Australian studies have used structured clinical interviews based on DSM criteria to establish both pre- and post-TBI psychiatric diagnoses, predictors of post-TBI disorders and the impact on outcome. For the current study, 100 participants with mild to severe TBI were recruited. Average age at assessment was 37.18 years (range 19–74), average time postinjury was 2.98 years (range 0.5–5.5 years). Measures used were the Structured Clinical Interview for DSM-IV diagnoses, Hospital Anxiety and Depression Scale, Alcohol Use Disorders Identification Test, Drug Abuse Screening Test, Glasgow Outcome Scale — Extended and the Sydney Psychosocial Reintegration Scale. The frequency of many disorders rose from pre-injury

to post-injury: depression from 17% to 46%; anxiety from 13% to 38% and psychotic disorders from 1% to 3%. Current rates of depression and anxiety were high (31% and 35% respectively). Two percent had a current psychotic disorder. Rates of substance use disorders fell from 41% preinjury to 21% postinjury. However, this is still significantly higher than the general population. Comorbidity of disorders was high. The association between pre-injury and postinjury psychiatric problems, predictors and psychosocial outcome is discussed.

## CONCURRENT SESSION 12: SERVICES FOR INDIVIDUALS WITH BRAIN INJURY

### **Treating the Psycho-Educational and Instrumental Needs of Families in Inpatient Brain Injury Rehabilitation Settings: An Evaluation of the Intensive Family Psychosocial Support (IFPS) Service**

Grahame Simpson,<sup>1</sup> Shay Bailey,<sup>1</sup> Daniella Pfeiffer,<sup>2</sup> and Brigitte Lane<sup>1</sup>

<sup>1</sup> *Brain Injury Rehabilitation Unit, Liverpool Health Service, Australia*

<sup>2</sup> *Westmead Brain Injury Rehabilitation Service, Australia*

Relatives experience significant distress and disruption when a family member sustains a traumatic brain injury (TBI). However, there are few reports in the literature evaluating intervention programs that target families in the acute inpatient rehabilitation phase. Employing a psychosocial framework, the current study documented an inpatient family intervention program (the IFPS program) that incorporated both psycho-educational and instrumental elements. Furthermore, pre-injury levels of complex psychosocial issues for each family were documented, to examine whether this influenced the amount of support required. A consecutive series of 17 families who had a relative with TBI admitted to the inpatient ward of the Brain Injury Rehabilitation Unit (BIRU) have been recruited. Two treating social workers coded all occasions of service provided to the families during the inpatient episode, using nationally standardised service coding systems. A purpose-designed Complex Psychosocial Issues Checklist was also devised (8 items, total score 0–24), and completed independently by the BIRU Inpatient Program Manager. Families received an average of 22 hours of service (*SD* 14.8) during a mean length of stay of 11 weeks (*SD* 5.3). A total of 370.25 hours were provided as part of the IFPS program, coded in the following categories (Assessment 7%, Counselling 20%, Education/Information 24%, Case Management/Discharge Planning 29%, and Other services including advocacy, guardianship and management of family conflict, 20%). The same 370 hours were classified using the national Indicator For Intervention codes (i.e., the trigger for the service provision), with intervention around Relationship issues (25%), Adjustment (19%), and Environment (e.g., productivity, transport, housing, finance, legal and immigration issues; 41%) the most common domains. There was a significant correlation ( $r = 0.49, p < .05, n = 17$ ) between the global psychosocial complexity score and the hours of intervention. Specifically, individual items measuring family financial difficulties and social isolation also displayed positive correlations with the hours of intervention. The IFSP program addressed a broad range of family issues across psycho-educational and instrumental domains. Further evaluation of the program employing admission and discharge measures is currently being conducted.

## **Steps to Enable People and Communities: Self-Managed Support Networks for People with Brain Injury and Stroke in Queensland**

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Areti Kennedy and Sue Wright

*Steps Project, Acquired Brain Injury Outreach Service (ABIOS), Princess Alexandra Hospital, Australia*

An innovative project was developed in response to the ongoing rehabilitation needs of people with acquired brain injury (ABI) living in communities across Queensland. These needs are long-term and multifactorial, extending beyond the individual to the environment. The International Classification of Functioning, Disability and Health was used as a framework to develop an intervention encompassing both self-management and informal support components, aimed at improving the resilience and connectedness of people with ABI living in the community. The resulting intervention involves a 6-week group program (STEPS Group Program) delivered by trained leaders (both volunteer peers and healthcare professionals) who facilitate delivery of the formal self-management program as well as fostering continuation of the informal network over time. Ongoing leader support and supervision is provided by the project team. During 2006, 10 different sites from Mackay down to the Gold Coast have run STEPS programs with 8 of these sites continuing to meet informally. Groups run to date have included people with both traumatic brain injury and stroke, age range 19 to 60 years. Both carers and people with ABI have participated together. Leader training has been provided to 6 groups statewide. In 2007, it is anticipated that the groups will extend to both South West and Far North Queensland. A full evaluation of inputs, processes, outputs and outcomes for the groups and the leader training is ongoing and initial findings suggest that the STEPS program offers a promising avenue for ongoing support of people with ABI.

## **The Challenge of Evaluating Community Brain Injury Rehabilitation Services in New South Wales**

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Helen Badge

*GMCT Brain Injury Rehabilitation Directorate, NSW Health, Australia*

Diverse brain injury rehabilitation services in NSW have developed to accommodate the range of problems after brain injury, and in response to local consumer priorities and available services. However, these services work together in a state-wide network that provides comprehensive coordinated services for clients with varying needs. The network provides a unique clinical governance structure that supports quality improvements for rehabilitation services for all people with brain injury in NSW. The Community Outcomes Project was initiated in June 2006 to evaluate the 14 community brain injury rehabilitation services in NSW for adults and children. Mixed methodology will include an audit of current service evaluation activities, qualitative information from clients and staff and analysis of objective outcome data. This will provide an evidence base for current services and support quality improvements and ongoing comprehensive service evaluation. Initial data from the Community Outcomes Project will be presented including review of services, priorities for outcome and the framework for service evaluation. Improving evidence based practice through evaluation studies and the routine use of objective outcome measures is considered best practice in community rehabilitation. However, minimal high quality evidence

for the appropriateness and efficacy of community brain injury rehabilitation programmes is currently available. The many challenges of evaluating services and outcomes across such a diverse range of services will be discussed.

## **Assessing the Availability and Utilisation of ‘Resources’ in Community Rehabilitation for People with Acquired Brain Injury**

Melissa Kendall and Ray Quinn

*Acquired Brain Injury Outreach Service (ABIOS), Princess Alexandra Hospital, Australia*

Outcome assessment is a core activity informing brain injury rehabilitation across the continuum. In inpatient settings, outcome measurement is focused primarily on individual functioning but in community rehabilitation, environmental variables substantially influence outcomes and are themselves a key focus of intervention. To date, outcome measurement has failed to capture these aspects of community rehabilitation intervention. This study aimed to explore the utility of measuring environmental factors such as ‘resource availability’ and ‘resource utilisation’ when integrated with a traditional measure of individual functioning. The project utilised a pre-post design in which case managers rated 79 consecutive clients at commencement and completion of community rehabilitation on the MPAI-4 and newly developed parallel measures of formal and informal resource availability and utilisation. Significant change was demonstrated over time on each subscale of the MPAI-4 despite time since injury often exceeding two years. There was no significant change in formal or informal ‘resource availability’ for ability or adjustment subscales yet significant change occurred in formal resource utilisation for the ability subscale, and formal and informal resource utilisation for both the adjustment subscale and most items on the participation subscale. Significant change also occurred in both informal and formal resource availability across most items of the participation subscale. Many clients continue to improve on traditional measures of individual functioning, even many years postinjury, yet these differences may not necessarily be attributable to service delivery. Measuring ‘resource availability’ and ‘resource utilisation’ is a meaningful and informative addition to these traditional measures.

## POSTER PRESENTATIONS

### **Assessing the Concept of ‘My Life’ With People After Brain Injury**

Helen Badge<sup>1,2</sup> and Chris Chapparo<sup>1</sup>

<sup>1</sup> *Sydney University, Australia*

<sup>2</sup> *GMCT Brain Injury Rehabilitation Directorate, Sydney, Australia*

‘I want my life back’ is the primary rehabilitation goal reported by many people with brain injury. To reflect client’s own life situations, the assessment process needs to be collaborative and allow the client choice in what is important to them. However conceptual and methodological problems limit the extent to which current assessments can capture real life outcomes for people with brain injury. Problems which limit the ecological validity of assessments include systematic bias introduced when test developers set their own definitions of what a ‘normal’ level of participation involves, failure to capture satisfaction with performance or changes from each person’s premorbid lifestyle. The aim of this study was to develop an

objective approach to measuring the concept of 'my life' for people with brain injury that addresses many of these shortfalls and facilitates client-centred assessment. The study used a mixed methods design to produce both quantitative and qualitative data. The theoretical background to this approach will be described, drawing on the ICF and occupational therapy models. Presentation of initial Rasch analysis provide early support for this approach. Development of an objective and meaningful assessment for people after brain injury is feasible and valuable. The psychometric dilemmas in developing objective tests with greater ecological validity for individual clients will be discussed.

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### **Brain Injury, Bipolar Disorder and Car Mechanics: A Model for Understanding Change**

Oliver Beadle

*Private Practice, Melbourne, Australia*

Psychological adjustment following traumatic brain injury is a complex and challenging process. For many, the key tasks of adjustment include grieving preinjury abilities and the development of a new self-identity. This process is often made more difficult by the effect of common cognitive impairments following brain injury including impaired problem solving, abstract reasoning and self-monitoring skills. To facilitate change following brain injury, the complicated and often abstract concepts regarding the consequence of injury and process of recovery need to be explained in language that makes sense to the individual. Using an intervention strategy to facilitate self-identity (adapted from Ylvisaker, 2000), a case study is described of a 52-year-old man who sustained a severe traumatic brain injury, with a subsequent five year post injury diagnosis of bipolar disorder. By using a meaningful metaphor of car mechanics, the changes in functioning and potential due to his brain injury were able to be more effectively understood, and reframed in a positive and adaptive manner. This mechanical metaphor was further expanded to develop adaptive behaviour strategies to manage these changes and later modified to help explain and manage his mental illness, highlighting the flexibility of this approach. The benefits and challenges of using metaphor to facilitate psychological adjustment for the brain-injured population will also be explored.

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### **Emotional Processing in Spontaneous Confabulatory Syndrome After an Acquired Brain Injury**

Rodrigo Becerra and David Millichap

*State Head Injury Unit, Sir Charles Gardiner Hospital, Australia*

There appears to be some consensus about the fact that a combination of dysexecutive syndrome and memory deficits is the main etiological contributor in the development of Spontaneous Confabulation Syndrome (SCS). The bulk of the pertinent literature explores neuropsychological and neuroanatomical correlates with the syndrome. The current study, however, proposes that there is an intermediate level of analysis missing in this area, namely, emotional processing. The present case study therefore examines the neuropsychological profile of a patient (U.Y.) who developed a SCS after an acquired brain injury (ABI). Assessment comprised intellectual functioning, speed of information processing, memory and executive functioning,

but most importantly, it included an examination of his emotional processing. Results show that U.Y.'s psychological profile appears intact and that predictably his neuropsychological assessment suggests executive and memory weakness. Analysis of the content of his confabulations is not suggestive (in contrast to the current literature) of purely compensatory content. His emotional processing assessment indicates: (a) significant differences between the patient's level of emotional awareness and that reported by his spouse, (b) failure to predict advantageous outcomes in a gambling task, (c) poor performance on emotional lexical and facial identifications. This study does not support propositions regarding the content of the confabulations after an ABI as being compensatory oriented responses. However, clear weaknesses in processing emotional stimuli emerge as an alternative or complementary explanation. It is concluded that assessment of emotional processing, in addition to standardised neuropsychological assessment, should be included in regular psychological screening as this might partly explain the nature of the confabulations.

### **Challenging the Great Divide: Refuting (Contradictory) Claims That Self and Other Facial Recognition are Laterally Dissociated Processes**

David Butler, Jack Broerse and Ken McFarland

*School of Psychology, University of Queensland, Australia*

A dual-task procedure is utilised to investigate claims that recognizing faces of ourselves and others are laterally dissociated processes involving opposing sides of the brain. Fifty-one right-handed university students (males = 19, females = 32,  $M = 21.34$  years,  $SD = 6.30$  years) were presented with a sequence of facial images consisting of a familiar other (Albert Einstein), an unfamiliar other, and themselves. Participants were asked to count how many times each of these particular faces was shown whilst engaging in a concurrent tapping task involving either their right or left hands. It was predicted that the lateralization of self-face recognition would manifest as an impairment in face counting efficiency while concurrently tapping with one of these two hands. Results indicated that a significant counting impairment occurred for all face types when tapping with the left hand, suggesting that both self and other recognition is predominantly mediated by the right hemisphere. Although partially consistent with previous evidence that recognition of self is mediated by the right hemisphere, this finding is also partially consistent with evidence that the recognition of others is mediated by the right hemisphere. We conclude that self and other face recognition are not laterally dissociated processes and discuss implications for the aetiologies associated with prosopagnosia and delusional misidentification disorders.

### **Predicting Adherence to Treatment in Outpatient Stroke Patients: A Framework for Studies Using Brain Damaged Patients**

N. Coetzee<sup>1</sup> and D. G. Andrewes<sup>1,2</sup>

<sup>1</sup> *Department of Psychology, University of Melbourne, Australia*

<sup>2</sup> *Department of Rehabilitation, Royal Melbourne Hospital, Royal Park Campus, Australia*

Adherence to medication is fundamental to optimal health recovery yet the compliance to medication rate is lower than 50% in most studies. This investigation proposes the development of a model of contributing fac-

tors to poor adherence. A statistical model was developed using multiple regression analysis to determine the relative contribution of a number of factors likely to contribute to adherence to medication. Twenty-six stroke patients and 29 amputee control patients who had completed a rehabilitation program were investigated. Medical adherence was determined from computed adherence metrics based on pill counts and subjective reports of patient knowledge of medication use. Model components believed to contribute to poor adherence were assessed by patient and partner self-rating questionnaires. Stroke patients showed a lower level of adherence compared to amputee patients. Cognitive and emotional dysfunction, beliefs about medication, and the level of care significantly impaired adherence to medicine regimes in stroke patients. Level of cognitive impairment and emotional impairment, and not beliefs about the importance of medication or level of care received at home, impaired adherence to medicines in amputee patients. Emotional dysfunction is the greatest debilitating predictor of poor adherence in both patient groups. These findings support the position that the study of adherence in brain damage patients should account for emotional, cognitive, and social factors. A model of adherence is proposed on the basis of these and other proposals based on the literature.

### **Neural Substrates of Posttraumatic Stress Symptoms in Children With Traumatic Brain Injury: What Do We Know From fMRI Studies?**

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Senem Eren,<sup>1,2</sup> Vicki Anderson,<sup>1,2,3</sup> Cathy Catroppa,<sup>1</sup> Amanda Wood,<sup>1,4</sup> and Justin Kenardy<sup>5,6</sup>

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In recent years, advances in brain imaging technology have allowed the examination of the neuroanatomical underpinnings of traumatic brain injury (TBI) and have made it possible to observe patterns of activation in localised brain regions during cognitive tasks. It is now established that specific cerebral regions, such as the prefrontal areas, are particularly sensitive to the impact of TBI. Functional magnetic resonance imaging (fMRI) has indicated patterns of hypoactivation in these vulnerable regions. Despite initial controversy, it is now well established that posttraumatic stress disorder (PTSD) can occur post-TBI. The underlying neurocircuitry of PTSD has also been examined using fMRI, demonstrating the involvement of the amygdala and anterior cingulate cortex. Currently, it is difficult to disentangle the symptoms of these two conditions at a neurobehavioral level. Drawing on fMRI findings, this imaging technique can be applied to the study of PTSD post-TBI to better characterise and investigate the neural substrates of symptoms, an area that has never been explored in either children or adults. This presentation will focus on examining the underlying neurocircuitry of posttraumatic stress (PTS) symptoms and the pathophysiology of brain dysfunction in TBI as observed from fMRI studies. The diagnostic issues in the assessment of PTSD in children with TBI will be addressed and the clinical implications of examining PTS symptoms post-TBI will be discussed.

## Assessing Patients' Capacity to Make Decisions: A Review of the Evidence

Dale Fogarty, Helen Tinson and Joanne Oram

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Patients with cognitive impairments arising as a result of brain injury, neurological illness and/ or systemic disease are increasingly referred for neuropsychological assessment of their capacity to make decisions, for example, the ability to assign an enduring power of attorney, manage their finances and make decisions about living/ lifestyle issues. Capacity is a complex construct for which there is currently no legislative guidelines or universally accepted, standardised practice regarding its assessment. This paper presents an extensive evidence based literature review concerning the reliability and validity of the various tools and procedures that are employed for the purpose of assessing decision-making capacity. Articles, published between 1990 and 2006, pertaining to the assessment of decision-making capacity, or the assessment of cognitive functions underlying this construct, in patients with brain injury, neurological disease or medical illness with consequent cognitive impairment, were reviewed. General conclusions regarding the paucity of literature pertaining to assessment of those decisions for which clinicians are frequently asked to comment, and the poor empirical evidence for currently used assessment tools, will be discussed. Specific recommendations concerning the need for systematic, multidimensional and culturally appropriate assessments will be presented with an aim to inform and enhance clinical practice.

## The Sibling's Experience: When Their Brother or Sister Sustains a Traumatic Brain Injury

Helen Harrington

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Siblings form a unique relationship with each other that differs from any other relationship formed. It is expected if one sibling's life is changed the other sibling's life may also be affected. Despite the many studies of the impact upon the family, the impact upon the sibling's life following traumatic brain injury (TBI) is relatively unknown. This qualitative study aimed to explore the impact on the siblings after a young adult brother or sister suffered a TBI. Four siblings have each described their experience. The principles of grounded theory were applied in the study allowing for the exploration of the siblings' account of their experience. The foundation of the findings is based upon the siblings' descriptions. The findings of the study identified that these siblings were significantly impacted for years following the TBI. Each sibling described an *ongoing 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 were also highlighted. Each sibling described *changed relationships* with family and friends. However, their lives displayed *positive adaptation* and growth despite these complex changes. The siblings in this study felt neglected and *forgotten* by the professionals.

## **Improving Outcomes for People With Severe ABI in Queensland**

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Rosamund Harrington and Nancy Magazinovic

*Jacana Acquired Brain Injury Service, Australia*

Advances in emergency medicine matched with increased funding of acute care services has resulted in increased survival rates for young people with severe ABI in Queensland. Rehabilitation services have primarily been targeted at those showing good potential for recovery within the first six to twelve months post ABI. There is an increasing body of evidence to suggest that timely access to targeted multidisciplinary rehabilitation services for the slow to recover client for a number of years post injury can result in a significant reduction in disability and improved long term quality of life. Limited availability of slow stream rehabilitation services, inadequate supports for carers, scarcity of long term supported accommodation options, and pressure on acute hospital beds have resulted in aged care placement for many survivors of severe ABI, denying them the opportunity for maximal functional recovery. This presentation will detail Jacana ABI Service's multifaceted approach to improve the accessibility of slow stream rehabilitation services within Queensland and its pioneering work in strengthening cross-government agency service system planning to address the lifelong rehabilitation, care and support needs of individuals with severe ABI. Topics covered will include development of rehabilitation services, workforce development, developing partnerships, lifestyle enhancement, clinical information system development and raising community awareness of ABI and its sequelae.

## **Working Together: Group Programs at Queensland Paediatric Rehabilitation Service**

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Nicola Hilton, Ramona Raggl and Linda Barry

*Queensland Paediatric Rehabilitation Service, Australia*

Working in groups prepares the young person with an acquired brain injury to meet the social demands of family school and community. Through group activities, the young person can develop the psychosocial skills necessary for satisfactory adjustment to disability and maintain good interpersonal relationships. This poster presentation will outline the types of group programs run by the Queensland Paediatric Rehabilitation Service. It will include a description of each program and some of the processes used to evaluate outcomes. It will also include general benefits of the group program model, particularly for adolescents, some of the limitations of group intervention and efforts made to maximise generalisation of skills learned in the groups.

## **Environmental Factors and Ecological Practice in Community Rehabilitation**

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Jacqui Holland, Sandra Grayson, Lorraine Lourensz and Hugh Walpole

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The International Classification of Functioning, Disability and Health (ICF) developed by the World Health Organisation (WHO) provides a framework for developing and evaluating community rehabilitation programs. The ICF addresses a number of domains such as body functions and structures, environmental factors, activities and participation. Environmental and personal factors combined can describe the contextual setting in which

people live and work. These can be facilitators and/or barriers during the rehabilitation phase and are often key issues in determining the success of rehabilitation. As such, discussion of environmental factors is a useful way to examine ecological practice in the community rehabilitation setting. We examine the unique facilitators and barriers in community based rehabilitation, and how these are addressed by our Enhanced Access Program (EAP). This specialised program is part of a broader community rehabilitation service which operates in the outer south-east of Melbourne. The Enhanced Access Program offers community rehabilitation for people of working age, and importantly includes transportation. The program is underpinned by the participation and social models of health. Groups play an important role within this framework. We describe a Conversation Group, including pre and post group evaluation data, as an example of how we implement ecological practice within the setting of community rehabilitation.

### **Show Me the Evidence: A Review of Structured Memory Groups in Brain Injury Rehabilitation**

Bronwyn McFarlane,<sup>1</sup> Iain Irving,<sup>1</sup> Belinda Armstrong,<sup>1</sup> and Natasha Lannin<sup>2</sup>

<sup>1</sup> *Royal Rehabilitation Centre, Sydney, Australia*

<sup>2</sup> *Rehabilitation Studies Unit, University of Sydney, Australia*

Difficulties with memory and organisation are common impairments after traumatic brain injury (TBI). Memory groups are commonly targeted towards people with TBI following discharge from hospital. The focus of such groups is the teaching of compensatory strategies for memory difficulties and usually includes an educational component and practical activities. A memory group has been running in the Brain Injury Rehabilitation Service (BIRS) at Royal Rehabilitation Centre Sydney for 5 years. The aim of this study was to assess the quality and evidence-base of the memory group to establish a multidisciplinary memory group program applicable to clients within BIRS. The review included conducting a focus group with existing clients, conducting a systematic search of published literature and studies of efficacy, and review of material by experienced, well regarded colleagues. The review of the memory group resulted in a new program, named Total Recall (TR). TR is facilitated for 2 hours once a week for 6 weeks. It addresses memory function and the memory process with a multidisciplinary approach. The sessions are facilitated by two staff and are interactive with participants contributing to the session voluntarily and via activities. Pre- and postmeasures on participants' performances on everyday functional tasks are now collected. The approach to quality assessment and program review embodied in this study is comprehensive. Results hold implications for therapists who facilitate memory groups with community-based clients.

### **Neuropsychological and Symptomatic Assessment of Group and Individual Based Recovery after Mild Traumatic Brain Injury**

Karleigh Kwapil, Anton Hinto-Bayre, Gina Geffen and Ken McFarland

*Cognitive Psychophysiology Laboratory, School of Psychology, University of Queensland, Australia*

Neuropsychological assessment is sensitive to measuring cognitive impairment after mild traumatic brain injury (mTBI) but the duration and type of symptoms that persist remain controversial. The present research sought to investigate group and individual based recovery of neuropsychological test

performance and postconcussive symptom reporting up to 3 months after mTBI. A group of 30 mTBI participants and 30 uninjured controls were serially and prospectively assessed on measures of neurocognitive performance and symptom reporting immediately after injury and after 1 week, 1 month and 3 months. Symptom reporting on the Rivermead postconcussive inventory separated the groups after 1 week but diagnostic accuracy was no greater than chance after 1 month. Neuropsychological measures showed strong diagnostic accuracy with the mTBI group performing more poorly than controls on all measures acutely, at 1 week and 1 month, with group differences still evident after 3 months. Three criteria utilising the concepts of reliable and clinically significant change were applied to the data. Overall, 73% of mTBI patients were impaired on one or more tests acutely, with 70% at 1 week, 71% at 1 month, and 52% demonstrating impairment after 3 months. Significant recovery was demonstrated by 20% of mTBI participants by 3 months; however, recovery remained incomplete for at least 50% of the mTBI participants by 3 months. The results highlight the importance of an individual approach to the assessment of mTBI and support the notion that a proportion of mTBI cases may have protracted difficulties.

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### **Approaches to Goal-Setting Within an Inpatient Stroke Rehabilitation Unit: Consensus or Conflict**

Emma Leach,<sup>1</sup> Petrea Cornwell,<sup>1,2</sup> Jenny Fleming,<sup>2,3</sup> and Terrence Haines<sup>2,4</sup>

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Goal setting is considered a fundamental component of the rehabilitation process. Models of rehabilitation have developed to provide a framework from which to structure the processes of goal setting and intervention in rehabilitation. Current practice in ABI rehabilitation comprises various formal and informal goal-setting approaches, with little evidence for the application of theoretical frameworks. The purpose of this research is to describe current practices of goal setting within a subacute rehabilitation setting from the perspective of therapists representing the disciplines of occupational therapy, speech pathology and physiotherapy. Qualitative semistructured email interviews were conducted with therapists from the geriatric assessment and rehabilitation unit of an Australian hospital. Therapists were required to respond to questioning with reference to identified rehabilitation patients. Three approaches to goal setting were identified: therapist controlled, therapist led and patient centred. Goals aimed at the ICF levels of impairment and activity limitations were predominant. Barriers to a patient-centred goal setting approach largely outweighed facilitators, however, potential successful resolutions were offered to overcome these barriers. The inability of patients to participate fully in the goal-setting process largely determines the approach taken by therapists. This process influences the level of patient centeredness incorporated into the goal-setting process. Goals expressed at the level of impairment by therapists may be stepping stones to goals perceived by patients at the level of activity limitations. Barriers to a patient centered approach can be overcome through education of the patient and family regarding stroke and modification of communications between therapist and patient.

## Music Therapy and Acquired Brain Injury

Maggie Leung and Jeanette Kennelly

*Queensland Paediatric Rehabilitation Service, Royal Children's Hospital, Australia*

Music therapy is a systematic process of intervention where a qualified music therapist uses music to promote health and well being. Music therapy in paediatric rehabilitation addresses physical, psychological, emotional, cognitive, communication, and social needs of individuals within a therapeutic relationship (Kennelly & Brien-Elliott, 2001). This poster will display the role of music therapy in paediatric rehabilitation supporting by evidence-based literature. It will highlight a number of music therapy programs, including the Modified Melodic Intonation Therapy (MMIT) (Baker, 2000) at the Queensland Paediatric Rehabilitation Service at the Royal Children Hospital in Brisbane. The MMIT is conducted by a music therapist and a speech pathologist with children with speech impairments after an acquired brain injury. The poster will outline the steps of the implementation of MMIT, and the benefit of the combined use of music therapy and speech pathology.

## Communicate With Confidence: A Course for People With Acquired Brain Injury

Jan Mackey,<sup>1</sup> Nadine Starritt<sup>2</sup> and Jacinta Douglas<sup>3</sup>

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People with acquired brain injury (ABI) frequently experience difficulty integrating into community activities and forming relationships due to their impaired social communication. In this paper we describe a communication skills training course developed for people with ABI and report the outcomes of the course evaluation. Nine adults (7 men, 2 women) with severe ABI participated in the course run by two clinicians over 8 weekly sessions. The intervention focused on the special needs of the ABI population, while being designed using language, format and content that reflected a mainstream training environment. The course was independently evaluated using a semi-structured interview with quantitative measures. Seven of the 9 participants and the two clinicians were interviewed separately following completion of the course. There was general consensus across the participants and the clinicians that the course was successful. In reflecting on their own experience, clinicians described the challenges they faced and outcomes they perceived each of the participants had achieved. Four of the 7 participants interviewed reported an increase in their confidence in communication. The remaining three reported no change. All were able to describe personal outcomes they had achieved and strengths and weaknesses of the experience. Learning through short courses is considered a desirable activity across the general population and does not have the negative connotations that may be associated with therapy and therapy based groups. The results of this evaluation serve to highlight the effectiveness of this model of learning social communication skills for people with ABI.

## Early Prognostic Factors for Return to Work After Traumatic Brain Injury

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This paper presents the results of a systematic review to identify variables and their prognostic value for return to work (RTW) after traumatic brain injury (TBI). RTW has been identified as being a key goal following TBI, with reported estimates ranging from 10% to 70%. Prediction of postinjury employment is important for planning rehabilitation, including structuring individualised vocational services. Studies examining prognostic factors associated with RTW after TBI using multivariate analysis accounting for covariates were included. Prognostic variables considered included preinjury, injury and early postinjury domains. English language studies were identified by searching 6 electronic databases, until June 2006. Searches yielded 1948 studies of which 58 met inclusion criteria. Methodological quality of each relevant study was rated using a 6-point scale by two independent raters. Mean methodological score for included studies was 3.9/6 (*SD* 0.9, range 1–6). Analysis focused on a subset of 28 studies that provided sampling from all three domains of preinjury, injury and early postinjury variables. Emphasis was placed on 6/28 studies which were rated as methodologically strong (score of  $5 \pm 6$ ). More than 150 variables from 56 areas were examined in the studies, but even within the subset of strong studies, there was little agreement regarding identification of variables with prognostic significance. The results are discussed in the context of methodological issues encountered during the course of the review. The paper concludes with recommendations regarding a minimum core set of variables that should be included in future studies.

## Measuring Information Processing in a Client With Extreme Agitation Following Traumatic Brain Injury Using the Perceive, Recall, Plan and Perform System of Task Analysis

Melissa Nott and Christine Chapparo

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Agitation following traumatic brain injury is characterised by a heightened state of activity with disorganised information processing that interferes with learning and achieving functional goals. A case study research design was employed. The PRPP System of Task Analysis was used to assess changes in task-embedded information processing capacity during occupational therapy intervention with a severely agitated adult in a rehabilitation context. Performance is assessed on 3 selected tasks over a 1-month period. Information processing difficulties during task performance can be clearly identified when observing a severely agitated adult following traumatic brain injury. Processing skills involving attention, sensory processing and planning were most affected at this stage of rehabilitation. These processing difficulties are linked to established descriptions of agitated behaviour. Fluctuations in performance across three tasks of differing processing complexity were evident, leading to hypothesised relationships between task complexity, environment and novelty with information processing errors. Changes in specific information processing capacity over time were evident based on repeated measures using the PRPP System of

Task Analysis. This lends preliminary support for its utility as an outcome measure, and raises hypotheses about the type of therapy required to enhance information processing in people with severe agitation. The PRPP system is sensitive to information processing changes in severely agitated adults when used to reassess performance over short intervals and can provide direct guidance to occupational therapy intervention to improve task embedded information processing by categorising errors under 4 stages of an information processing model: Perceive, Recall, Plan and Perform.

## Occupational Therapy Contextual Assessment Using the PRPP System of Task Analysis

Margie Rae

*Queensland Paediatric Rehabilitation Service, Australia*

Many paediatric measures of perception and cognition used by occupational therapists are limited in their ability to meet the demands of contemporary practice. The Perceive, Recall, Plan and Perform (Chapparo and Ranka, 2003) system of procedural task analysis, an occupational therapy assessment tool, is client centred, occupation focused and criterion referenced. It identifies information processing difficulties and problems in occupational performance at the routine, task or subtask level. Observation of children and adolescents with acquired brain injury doing everyday tasks is a powerful assessment tool. The PRPP allows the therapist to explain how the child is making sense of the world. It is designed to assist occupational therapists to structure their observations to encompass all elements of information processing. The poster presentation describes the two stages of the PRPP assessment tool and includes diagrams and tables explaining the scoring system.

## The Relationship Between Clients' Functional Status and the Therapeutic Working Alliance in Postacute Brain Injury Rehabilitation

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To examine the impact of brain injured patients' cognitive abilities on their working alliance with their therapist in postacute rehabilitation. Cognitive tests were administered to brain injured individuals at the beginning of postacute, holistic brain-injury rehabilitation. Eighty-six clients as well as their primary therapists rated their working alliance at 4 time points throughout a 14-week rehabilitation program. Clients had suffered a traumatic brain injury ( $n = 27$ ), a cerebrovascular accident ( $n = 49$ ) or another neurological insult ( $n = 10$ ). Measures: (1) neuropsychological tests of attention, memory and executive functions, (2) the Working Alliance Inventory, client and therapist form. Overall, the relationships between cognitive tests and working alliance ratings were weak. Attention problems tended to be related to both clients' and therapists' experience of a poor working alliance. Memory problems were related to clients' experience of a good working alliance at program start, and to therapists' experience of a poor working alliance, mostly towards the end of rehabilitation. Of the executive tasks, only a word fluency task was related to therapists' working alliance ratings. Brain injured individuals' performance on cognitive tests tended to be differentially related to their own and their

therapists' perspective of their working alliance. The weakness of the correlations between cognitive tests and working alliance ratings may indicate that a good working alliance is achievable even with clients with severe cognitive difficulties. Clinical implications are discussed.

### **Pathways for Return to Work After Severe Traumatic Brain Injury: A Subgroup Analysis**

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Grahame Simpson, Phillipa McRae and Lauren Gillett

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In previous presentations, we have reported on the characteristics of people with severe traumatic brain injury (TBI) attending 3 different return-to-work programs offered by the Head2Work (H2W) program at the Brain Injury Rehabilitation Unit, Liverpool Hospital, Sydney. Results have shown that each group had distinct premorbid vocational, injury and postinjury adjustment characteristics. The current study objective was to examine the success rates for return to work at case completion for the three groups, and the post-injury return to work pathways. A total of 77 participants who completed the three H2W programs (return to preinjury employment  $n = 37$ , job seeking  $n = 25$ , pre-employment training  $n = 15$ ) were included. The sample was drawn from a consecutive series of patients admitted to the program over a 3-year period. A protocol was devised and participant files were reviewed to collect data over a range of domains including employment outcomes from the program. Successful return to work at case closure for the sample as a whole included open employment (full duties) ( $n = 30$ ), open employment with modified duties ( $n = 15$ ), and sheltered work ( $n = 4$ ). Chi square analysis found that a significantly higher proportion of people in the return to pre-injury employment group had a successful return to work compared to the other two groups. A Kaplan-Meier analysis found a significant difference in the return to work trajectories for the three program types, with the majority of participants undertaking return to pre-employment completed prior to 2 years postinjury, whereas the majority of case closures for the job seeking group occurred between 2 and 5 years post-injury. The pathways for return to work vary for the different H2W programs. Early intervention is critical for people returning to pre-injury employment. Further research will document the stability of longer-term employment outcomes for these groups.

### **Risk Factors for Nursing Home Placement from Acute Inpatient Rehabilitation Settings for People With Complex High Support Needs After Traumatic Brain Injury**

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Grahame Simpson, Leanne Hassett, Taryn Jones, Barbara Strettlles and Marianne Bush

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Discharge to aged-care residential facilities (nursing homes) is an unsatisfactory and unacceptable outcome for people after traumatic brain injury (TBI). However, little is known about the risk factors that increase the likelihood of such outcomes. As part of a larger study investigating accommodation options for 39 patients of the Brain Injury Rehabilitation Unit (BIRU), Liverpool Hospital in Sydney with high support needs after TBI, a subgroup of 19 patients with FIM scores  $< 90$  were examined to identify risk factors for an eventual nursing home placement. The sample

of 19 was drawn from a consecutive series of patients admitted to the BIRU over a 3-year period. Eight patients in the group were discharged to a nursing home; the other 11 were discharged home. Data was collected using a structured protocol by means of interviews with family and staff, as well as review of the medical files. There were no significant differences between people with TBI discharged home and discharged to a nursing home across a range of domains including demographic (age, sex), premorbid psychosocial characteristics (relationship status, living circumstances, psychopathology), initial injury severity, and functional status on admission to inpatient rehabilitation. There were significant differences, however, among the characteristics of family members. Family members who were able to provide a home-based discharge had more emotional and practical support from others, were better able to manage the physical demands of care, had more financial resources and fewer other competing commitments. There were no intrinsic differences in the status of the person with TBI that determined their discharge status. Some characteristics of families who felt able to undertake the massive commitment required to provide support to their relative were identified. More community-based alternatives to nursing homes are needed in cases for whom (a) there are limited family networks or (b) families are unable to provide such support.

### **Correlates of Subjective Quality of Life Following Traumatic Brain Injury**

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Understanding subjective quality of life (SQOL) outcome following traumatic brain injury (TBI) is important for researchers and rehabilitation providers. Little research has been conducted in this area to date. Most of the available studies have investigated relationships between SQOL and only a small number of variables. In response to calls from international consensus groups (e.g., Bullinger, 2002; NIH, 1999), the present study sought to investigate the relationship of SQOL with a comprehensive raft of variables drawn from 5 salient domains, including preinjury and clinical variables, physical, psychological, cognitive, and social variables. Frisch's (1994) 16-item Quality of Life Inventory (QOLI), an importance-weighted measure of life satisfaction was used to provide SQOL ratings. Previous research confirmed a 3-factor structure for the QOLI within a local TBI sample (Thomas et al., 2006). In addition, a raft of measures and variables from the five domain areas already mentioned were administered within a sample of 663 adults, at time-points up to 1 year following TBI. The results showed moderate relationships between preinjury estimates and post-injury SQOL ratings. Weak to moderate relationships were observed between many of the variables across the 5 domains and SQOL. The strongest relationships with the QOLI were seen between other subjective ratings of mood, postconcussive symptoms, pain and fatigue. Weakest relationships with the QOLI were seen between more objectively rated aspects of physical and cognitive functioning. Future research will use this information to develop predictive models of SQOL outcome following TBI, and indicate those patients at risk of poorer outcome.