Abstracts of the 32nd Brain Impairment Conference, 7–9 May, 2009, Sydney

Conference Theme: Life Changes after Brain Injury — Structure, Function, Participation

PRECONFERENCE WORKSHOPS

WORKSHOP 1

Strategies and Programs to Help Improve Executive Functions in Young Children

Adele Diamond

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Executive function (EF) skills are critical for success in school and life. Many children begin school lacking needed EF skills, especially lower-income children. Educational practices that improve EFs lead to better academic outcomes and may head off mental health problems (such as ADHD) from developing. Many issues are not simply education issues or health issues; they are both. EFs are, of course, brain-based, but they are not immutable. Evidence will be presented that they can be improved even in children as young as 4 to 5 years of age, in regular public-school classrooms, with regular teachers, without specialists or special equipment. Many interventions address fixing problems after they have arisen; working with young children to prevent problems from arising may lead to far better outcomes at much less expense. For example, an innovative early education program, *Tools of the Mind*, improves EFs by (a) embedding supports for, training in, and challenges to, EF in *all* school activities and (b) emphasising social pretend play (*remember* what you planned and *follow through*, *hold in mind* your role and those of others, *inhibit* acting out of character, and *flexibly adjust* as your friends take the play scenario in unanticipated directions). Social pretend play thus exercises all three core EFs (working memory, inhibitory control, and cognitive flexibility). Research shows that activities that often get squeezed out of school curricula, including the arts and physical exercise, are excellent for developing EFs and thus can be critical for academic success and for success later in life. Schools are also under pressure to cut back on time allowed for play to provide more time for academic instruction. However, children in *Tools of the Mind* classrooms spend more time on play and yet perform better on academic outcome measures than comparison children who spend more time in direct academic instruction.

Learning Objectives:

- To come to an understanding of the 3 core EFs.
- To understand that EFs can be improved even in 4–5 year olds, with potentially long-lasting results, and that doing so is important for both education and health outcomes.
- To understand the principles behind programs that are effective in improving EFs in children.

WORKSHOP 2

Psychiatric Disorders and Substance Use Following Traumatic Brain Injury: Their Nature, Predictors and Management

Jennie Ponsford

Monash University, Monash-Epworth Rehabilitation Research Centre and National Trauma Research Institute, Melbourne, Australia

It has been widely reported that individuals with traumatic brain injury (TBI) may develop psychiatric problems post-injury. However there is considerable variability in reported rates of disorders, which reflects significant methodological differences in studies, in terms of measures used, recruitment methods, participants' injury severity, time since injury and documentation of pre-injury psychiatric and substance use disorders. Few studies have examined a range of disorders, most having focused on depression. In this workshop, results of both retrospective and prospective studies will be presented, which have aimed to establish the frequency of Axis 1 psychiatric disorders pre- and post-TBI, in participants up to 5 years post-injury, predictors of post-injury psychiatric disorders including pre-injury disorders, and their association with functional outcome. Results of a second prospective study examining alcohol and drug use in the first three years after injury, relative to pre-injury consumption and in comparison with a demographically similar control group will also be presented. Factors associated with post-injury alcohol and drug use will be examined. The findings from these studies highlight the need for interventions to alleviate anxiety, depression and alcohol use after injury. Preliminary findings from intervention studies aimed at addressing these problems following TBI will be presented.

WORKSHOP 3

Goal Setting in Brain Injury Rehabilitation: Why to Do It, How to Do It and Why It Can be Difficult Sometimes

Jonathan Evans

University of Glasgow Section of Psychological Medicine, United Kingdom

This workshop will provide an opportunity for participants to review how goal-planning systems are used in brain injury rehabilitation settings, to discuss some of the challenges that goal planning systems present for rehabilitation teams, and to consider some of the ways of addressing those challenges. Goal-planning procedures will be described and illustrated with several case examples. Topics covered will include: Identifying goals as part of the formulation process; negotiating achievable goals with clients/patients; writing SMART goals; long-term goals, short term goals and plans of action; reviewing progress, measuring success; challenges in interdisciplinary goal setting. The workshop will provide an opportunity for participants to discuss applying the principles and challenges of goal setting in their own work environment.

WORKSHOP 4

The Impact of TBI on Family Functioning: Models of Family-Centered Intervention to Improve Family and Survivor Adaptation

Shari Wade

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Several recent review articles underscore the dearth of empirically-based treatments for the social and behavioral difficulties caused by pediatric TBI. The lack of established behavioral treatments for pediatric TBI may be, in part, attributable to the barriers to care facing many families including time, distance, cost, and the lack of skilled providers. Increasingly, clinicians and researchers are looking to telehealth interventions as a cost-effective way to deliver a wide range of mental health interventions. This workshop focuses on the lessons that we have learned through implementing four family-centered online interventions to improve survivor and family functioning following TBI using internet/web and videoconferencing. This workshop will review the literature on telehealth interventions with TBI. It will cover the content and layout of three different approaches to intervening via the web. These include: (1) a collaborative family problem solving intervention model spanning childhood through adolescence; (2) a parent-skills intervention targeting parents of younger children with TBI integrating web content with live coaching; and (3) an executive function/self-regulation intervention for adolescents with TBI and their families. In-depth discussion will consider existing empirical support as well as the strengths and weaknesses for each of these approaches. Clinical and technological challenges will be reviewed, and strategies for dealing with them addressed. The need to match intervention content and modality to the intended target population will be considered, including issues associated with working with minorities and individuals unfamiliar with technology. Finally, the workshop will provide suggestions and resources for implementing your own telehealth intervention.

WORKSHOP 5

Psychological Trauma, Brain and Behaviour Across the Lifespan

Jan Ewing

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The presentation includes information on the effect of fear and trauma on both the adult brain and on the developing brain of a child. The effects of misattunement and neglect are also discussed. The impact of trauma on the neurobiological networks involved in arousal and behavioural modulation is presented in addition to the implications of such modulation difficulties for future responses to life challenges. What are the typical coping strategies for undiagnosed and untreated trauma? Why do we see so much substance use and compulsive re-exposure to high risk situations in response to trauma? How does trauma affect the ability of the child to concentrate at school and to comply with the expectations of parents and teachers? How might early trauma predispose a child to behavioural regulation difficulties in the future? What are the factors that determine the effect of trauma in adulthood? Who recovers and why? The implications of our growing knowledge of the neuropsychology of trauma for early intervention and treatment are also discussed. This workshop will be of interest to all professionals working with clients who have a trauma history including both childhood neglect and abuse, combat-related trauma, acute traumatic events in adulthood and those involved in the criminal justice system. This would include clinical psychologists, psychotherapists, social workers, forensic psychologists, teachers, drug and alcohol workers, lawyers and judges. It is also of relevance to neuropsychologists who wish to better understand the impact of trauma on the brain and the implications for neuropsychological assessment of this population.

PRESIDENTIAL ADDRESS

Everyday Memory for Everyday Tasks: Prospective Memory Following Brain Injury

Glynda Kinsella

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Memory impairment following traumatic brain injury is common and has been traditionally investigated via neuropsychological measures of retrospective memory, that is, focusing on what can be remembered from the past or previously learnt material, such as recalling your mobile phone number or recalling a list of words when prompted after a short delay. However, many everyday memory failures relate to difficulties in remembering to carry out delayed intentions; for example, passing on a message to a work colleague when you next meet or remembering to buy milk on the way home from work. This form of memory is described as prospective memory. Although challenging to assess reliably, evaluation of prospective memory is gradually being included in outcome assessments following traumatic brain injury. This paper will review the emerging literature on prospective memory and traumatic brain injury and present findings from a follow-up study of older adults who have experienced traumatic brain injury in order to illustrate some of the issues in the assessment and management of prospective memory performance following trauma.

INVITED AND KEYNOTE SPEAKERS

INVITED SPEAKER

Adult Neural Stem Cells: Their Role in CNS Injury and Disease and Their Potential as Future Therapeutic Targets

Anne Cunningham

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Knowledge of the biology of adult neural stem cells (NSCs) has expanded remarkably in the last two decades and we are accruing a better understanding of where these cells reside and how they are affected by disease and injury of the central nervous system (CNS). As a result, the potential capacity of the brain and spinal cord for recovery and regeneration is becoming better appreciated. An updated view of NSCs and the two neurogenic niches where they predominate in normal adult mammalian brain, the hippocampus and olfactory bulb, will be presented. Current evidence for their responses

and involvement in CNS disease and injury will be discussed, including a role in temporal lobe epilepsy. These findings highlight the need for further studies to achieve a deeper understanding of the underlying mechanisms controlling the biological properties of NSCs, prior to clinical applications. Our laboratory is particularly interested in the role these cells play in neuropathology and their response to specific CNS injuries. Original data will be presented delineating the activation and role of NSCs in an animal model of spinal cord injury. We will provide evidence that they may function more as ‘bad guys’ than ‘good guys’ in this situation. Manipulation of the biological properties of endogenous NSCs may represent a major step forward in future neurological therapies but first will require a sophisticated and evidence-based view of their function in both the normal and pathological CNS.

INVITED SPEAKER

Protecting the Brain From Neurosurgeons: Recent Advances in Neural Protection in Neurosurgery

Marcus Stoodley

Australian School of Advanced Medicine, Macquarie University, Australia

Neurons are at risk of mechanical and ischaemic damage during neurosurgery. Recent advances in imaging, monitoring, anaesthetic, and surgical techniques play an important role in neural protection during neurosurgery. Significant advances were made in neurosurgery as a result of the structural imaging provided by CT and MRI. Further improvements in surgical decision making and planning are now being made with functional and physiological imaging such as functional MRI (fMRI), PET, SPECT, and combinations of these modalities. Intra-operative electrophysiological monitoring can be used as a localiser of function as well as provide the surgeon with warning of impending damage. Surgical and anaesthetic techniques have evolved to minimise physical and ischaemic brain trauma. Neurosurgery has evolved dramatically over the last two decades. The current focus is on surgical planning and decision-making, minimally invasive techniques, and protection of neurological function.

INVITED INTERNATIONAL KEYNOTE SPEAKER

Practical Relevance of What We Know About Genetic and Environmental Influences on Prefrontal Cortex

Adele Diamond

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Disturbances in cognitive control functions (‘executive functions’ such as attentional control, self-regulation, working memory, and inhibitory control) that depend on prefrontal cortex are found in a great many neuropsychiatric disorders, such as ADHD and depression, and are often sequelae of closed head injury. This talk will address:

(a) what executive functions are

(b) *bidrectional* relations between prefrontal cortex (executive functions) and the amygdala (stress)

(c) roles of genes that affect the level of dopamine in prefrontal cortex, and sex differences in that, and

(d) briefly, how behavioral interventions with young children may head off problems before they lead to diagnoses of impairments in frontal lobe functions.

Learning Objectives:

- To understand how stress can make one appear to have a disorder of executive function.
- To understand how putting feelings into words (how increasing activation of prefrontal cortex) can reduce stress, anxiety, and PTSD and decrease amygdala activation.
- To understand how the dopamine system in prefrontal cortex differs from the dopamine systems elsewhere in the brain, and that variations in dopaminergic genes therefore affect prefrontal cortex differently than other brain regions.
- To understand why there may be gender differences in the dopamine system in prefrontal cortex.

INVITED NATIONAL KEYNOTE

Sleepy Heads: Fatigue and Sleep Disturbance Following Traumatic Brain Injury

Jennie Ponsford

Monash University, Monash-Epworth Rehabilitation Research Centre and National Trauma Research Institute, Melbourne, Australia

Despite the fact that fatigue and/or sleep disturbance are reported by up to 70% of individuals with moderate to severe traumatic brain injury (TBI), there has been relatively little research investigating the specific nature and causes of these problems. In this lecture, the results of a series of studies of fatigue and sleep disturbance following TBI will be presented, with the aim of shedding some light on these issues. The first study has examined the validity of subjective fatigue scales following TBI, frequency of self-reported fatigue and the relationship between self-reported fatigue and demographic factors, injury-related factors and mood in a group of 120 TBI participants and 90 controls. The second study examined the Coping Hypothesis, by investigating selective attention and vigilance, and their relationship with subjective and objective fatigue measures following TBI. The third study describes the self-reported sleep changes following TBI and the relationship of these subjective complaints with demographic and injury-related factors, anxiety and depression in TBI participants and matched controls. The final studies consider the effect of TBI on mechanisms controlling sleep as measured objectively, one focusing on the sleep timing mechanisms and circadian control of sleep by measuring melatonin production and the second examining overnight polysomnography, providing evidence of differences in sleep architecture between the two groups. The implications of all these findings for management of fatigue and sleep disturbance following TBI will be explored.

INVITED INTERNATIONAL KEYNOTE SPEAKER

Survivor and Family Recovery following TBI: Evidence for Reciprocal Influences

Shari Wade

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Existing evidence suggests that caregiver and family functioning influence the recovery of the injured individual, with individuals from better functioning families evidencing greater recovery. Conversely, psychological and behavioral changes arising from TBI may contribute to family burden and distress. However, few studies have examined the quality of family interactions following TBI and the relationship of caregiver behaviors (warmth, criticism) to survivor adjustment. This presentation examines the hypothesis that parent and child behaviours exert reciprocal influences on one another, with children from warm–responsive parents evidencing better recovery. Support for this hypothesis will be drawn from two studies of child and family adaptation following pediatric TBI. *Methods:* Participants included 87 young children with moderate to severe TBI and a comparison cohort of 117 children with orthopedic injuries not involving the CNS. Participants in Study 2 included 50 adolescents with moderate to severe TBI. Parent and child behaviours toward one another were rated from videotapes of interactions during free play and a teaching task with the younger children and during a problem-solving discussion with the adolescents. Measures of parent and family adjustment included psychological symptoms and family functioning. Measures of child/adolescent adjustment included the Child Behavior Checklist and Behavioral Rating Inventory of Executive Function. *Results:* Findings indicate that warm–responsive parenting is associated with fewer child behaviour problems and better behavioural adaptation following TBI. *Conclusions:* These findings support the importance of working with caregivers and families to reduce their distress and to facilitate positive communications/interactions with the survivor.

INVITED NATIONAL SPEAKER

Rebuilding a Life: Improving Long-Term Participation Outcomes Following Severe Brain Injury

Sue Sloan

Osborn Sloan & Associates, Australia

Outcomes following severe acquired brain injury (ABI), when measured in terms of participation in meaningful occupations and valued life roles, are generally poor in the long-term. This paper will provide a review of the key literature, and give an outline of participation and describe how it relates to outcomes that matter for individuals. The participation outcomes of two groups who were on average 7 years post injury will be presented. The first, a larger group, received community-based therapy services over a 1-year period. The second is a subgroup of the larger group and describes outcomes for individuals who received community- based therapy services over a 3-year period. All participants received a program of input based on the Community Approach to Participation (CAP), an individualised and collaborative model of community-based practice that aims to maximise life role participation, despite complex, persisting impairments. The outcome measures utilised in the study included the Functional Independence

Measure, Community Integration Questionnaire, Role Checklist, Care and Needs Scale, and hours of paid and unpaid support. The results of this study provide evidence that the community-based therapy input can result in significant changes in levels of life role participation as well as a significant reduction in support needs and long-term cost of care. Discussion of the results will highlight the key elements of clinical practice as well as the potential for meaningful improvement in life role participation even many years post injury.

INVITED INTERNATIONAL KEYNOTE SPEAKER

Goal Setting in Brain Injury Rehabilitation: Theory, Practice and Challenges

Jonathan Evans

University of Glasgow Section of Psychological Medicine, United Kingdom

The purpose of rehabilitation, including brain injury rehabilitation, is to reduce disability and increase participation in valued activities. This broad purpose is reflected in the more specific aim of enabling people to achieve personally relevant goals. In this context, systems of goal setting or goal planning are generally considered to be critical in the rehabilitation process. There is substantial evidence that goal setting improves outcome (performance) in a wide range of industrial settings, though much less evidence relating to the use of goal setting in rehabilitation. Several disciplines within psychology and medicine (but without brain injury rehabilitation) have elaborated theories related to goal attainment and self-regulation, the process of managing one’s own goal-directed behaviour. These theories may be highly relevant to brain injury rehabilitation, with implications for maximising the achievement of goals during rehabilitation, being relevant to helping address characteristic deficits in executive function and teaching clients how to manage life tasks outside of formal rehabilitation. This paper will briefly review theories of goal setting, discuss their relevance to brain injury rehabilitation and describe the use of a goal planning system by an interdisciplinary neuropsychological rehabilitation team. The advantages and challenges associated with use of this system will be discussed. Data from a recent study aimed at increasing recall of therapy goals using SMS texting technology will also be presented.

CONCURRENT SESSION 2 — Emotion and OCF Models

Modeling the Role of the Orbitofrontal Cortex in Emotional and Social Function

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New research has focused on an interactive nature relationship between the amygdala and the orbitofrontal cortex (OFC). In this light the amygdala is evaluated as an emotional processor which serves the analytical and moderating roles of the OFC. The apparently inhibitory nature of the OFC may now be seen in a more complex role as providing (1) learned rules of anticipated reward as revealed in paradigms such as reversal learning, (2) the institution of behavioural response via the medial prefrontal cortex and the anterior cingulate, and (3) by allowing the amygdala to indirectly provide appropriate visceral warnings during social interaction. This review paper provides a model of an OFC system that is based on both human and non-human research. The model is in keeping with neurophysiological connections between the OFC and other structures and has implications for explaining a number of psychiatric and other behavioural disorders.

Examining Possible Causes of Poor Social Behaviour After Traumatic Brain Injury: Stereotypic Social Knowledge and its Regulation

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Introduction: Prefrontal regions of the brain are activated when making judgements about gender, race, dominance and general attractiveness of faces. Conversely, patients with frontal lesions appear to be less sensitive to implicit gender stereotypes than controls. Consequently, it has been suggested that the frontal lobes may mediate stereotypic social knowledge and that degraded access to such stereotypes accounts for poor social behaviour following frontal lobe injury. However, there is an alternate point of view. As the frontal systems have an executive regulatory role over environmentally evoked responses, impairment may lead to (intact) social stereotypes being unregulated. *Method:* This study aimed to examine these two competing theories by comparing strength of implicit stereotypes as measured using the Implicit Association Test (IAT) with explicit measures of stereotypes. 14 adults with severe, chronic, traumatic brain injury (TBI) (mean duration of PTA = 94.8 days; mean time post injury = 11 years) were recruited along with 14 demographically matched controls. Reaction time was measured for responses to both stereotypically consistent word pairs (e.g., 'male/strong') and inconsistent pairs (e.g., 'male/weak') (IAT effect). Participants also completed two questionnaires tapping explicit, gender stereotypic views and a range of executive functioning measures. Using these measures it was found that the TBI group were slower than controls but showed a similar IAT effect. *Results:* Implicit stereotypic behaviour was correlated to explicit values in the TBI group but not the control participants. Processing speed was correlated to IAT performance. Working memory was associated to explicit stereotypes in the TBI group while mental flexibility was associated with explicit stereotypic views in controls. The present findings support the executive dysfunction account of post-morbid social deficits.

Psychological Treatment for Anxiety Following Traumatic Brain Injury: A Systematic Review

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Introduction: Anxiety is common in the general population and individuals with traumatic brain injury (TBI) may even have increased risk of developing anxiety. Treatment options for anxiety include psychological therapies, however, there are currently no systematic reviews examining the evidence for these approaches for people with TBI. The aim of this paper is to review trials focusing on psychological management of anxiety following TBI. *Methods:* Eleven electronic databases were searched including MEDLINE and PsycINFO. Key journals were also hand-searched and reference lists of included trials were examined. Criteria for included trials comprised: (1) participants over 5 years old; (2) participants sustained a TBI, and (3) used psychological treatment targeting anxiety (disorder and/or symptomatology). The two authors independently reviewed all citations identified. Methodological quality of randomised controlled trials (RCTs) and single-case experimental design (SCED) trials were assessed using standardised scales. *Results:* Twenty-three studies met inclusion criteria, of these, three were RCTs. The remaining 20 studies were case-series and single-subject design trials — including three SCED trials. Focus was placed on the two RCTs of higher methodological quality. The first trial showed benefit of cognitive-behaviour-therapy (CBT) compared to supportive counselling for people with mild-TBI and acute-stress-disorder. The second trial showed reduction of anxiety symptoms following combined CBT and neurorehabilitation compared to no intervention for people with mild-moderate TBI. Although the SCED trials identified met inclusion criteria, they were not directly relevant to the scope of the review. *Conclusions:* Evidence was found for the effectiveness of psychological treatment for anxiety in people with mild and moderate TBI.

CONCURRENT SESSION 3: Cultural Frameworks

Critical Tensions in Talk About Brain Injury

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This paper presents a review of potential applications of a critical discourse perspective to the field of brain injury. Critical Discourse Analysis (CDA) examines spoken and written texts as a means to understand the two-way relationship between discourse and cultural context. CDA is particularly interested in how language use reflects and creates power relationships between those involved in the communication. In order to illustrate this perspective, this paper discusses a purposively selected set of texts about brain injury from a range of institutional contexts: submissions to government, scholarly reports, academic textbooks, media reports, inter-professional interaction, and professional–client interaction. The analysis focuses on two lines of tension that emerge from an examination of this discourse. The first line of tension is that of problem talk vs. positive talk. Talk about the problems associated with brain injury forms an essential component when seeking support, and yet talk about positive outcomes forms an essential component when describing the rehabilitation journey. The second line of tension identifies the conflict between talk about client-centred approaches to rehabilitation and talk about client self-direction, as the agent of empowerment is the clinician (not the person with brain injury), and the presence of cognitive impairment confuses the recognition of self-direction vs. lack of compliance. The methodology of CDA is proposed as a tool for reflective clinical practice, as it provides a systematic means to examine health professionals' interactions and promotes the development of a critical understanding of the cultural ideologies and institutions in which practice is located.

Developing Targets for Outcomes of Treatment of Brain Injury

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Australasian Rehabilitation Outcomes Centre (AROC) provides a national benchmarking system whose aim is to improve clinical outcomes of rehabilitation. Brain injury rehabilitation enables those who have experienced a brain injury to maximise their abilities and achieve optimal functioning. This study aimed to develop targets for outcomes of brain injury rehabilitation, providing hospitals with benchmarks against which performance could be measured, ultimately improving patient care. Hospitals across Australia were invited to attend a benchmarking workshop. Episode data for year ending 2007 was grouped using the AN-SNAP version2 classification system. FIM admission score, time since onset to rehabilitation, length of stay, FIM change and discharge destination were analysed at a national and sector level. Results of further in-depth analysis of participating hospital data using casemix-adjusted relative mean improvement, a method by which hospital data can be compared with data from other hospitals, were completed. The workshop provided an open forum for discussion of functional outcomes pertinent to brain injury rehabilitation. It was agreed that further analysis and consultation be required before a set of draft outcome targets are developed. This work is currently underway. Once agreed, draft targets will undergo a consultation process across the entire rehabilitation sector. To ensure targets remain relevant, they will be updated and reviewed within 12 months. It is hoped that these quality targets can contribute to the improvement of clinical outcomes for brain injury rehabilitation throughout Australia.

Using the WHO International Classification of Function in a Community Therapy Team

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In the past 4 years, the Community Rehabilitation Team (CRT), Westmead Brain Injury Rehabilitation Service, has used the World Health Organization (WHO) International Classification of Function (ICF) as one of the core frameworks that facilitates the community integration of adults following a traumatic brain injury and the adjustment of family members. The ICF affords the team with a structure to ensure a focus on client community participation, while also addressing body structure and function and activity issues as required. Goals are established collaboratively with clients and family members and documented in a database according to three ICF components: body structure and function, activity and participation. As the team perceived that the needs of family members were not sufficiently acknowledged in the ICF, a fourth component ‘family’ was added. Goals are reviewed during team meetings every 3 months and new goals established and documented. An analysis of goal achievement in the past 2 years was conducted in late 2008. This presentation will: explain the manner in which the CRT uses the ICF to assist in structuring service provision, provide examples of goals established using the ICF components, and describe the outcomes of the goal achievement analysis. The CRT has found the ICF a beneficial framework to underpin its service provision and to formulate, document and review client and family-centred goals. The limitations of this approach will also be outlined.

Getting to Know the ICF: Novel Learning and Application Methods for Clinicians

David Kellett

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Clinicians working with people who have sustained an acquired brain injury may best address their clients needs following the development of a comprehensive understanding of human functioning and disability. The World Health Organisation (WHO) International Classification of Functioning, Disability and Health (ICF) serves as a promising model to support of this goal. Despite considerable enthusiasm for the WHO ICF as a comprehensive model of functioning and disability, its translation into a highly relevant and usable form for clinicians remains elusive. Excessive working memory demands generated by the models component interactions may largely explain the apparent limited utility of the ICF in clinical settings to date. Using the BODY, ACTIVITY and ENVIRONMENT components of ICF, in addition to a temporal component, a model can be constructed to adequately derive other ICF components. The resultant decrease in working memory demand that arises when using this adapted model may facilitate improved utility of the ICF for clinicians. Chunking, visual imagery, and language-based techniques will be described to promote learning and application of an adapted ICF model for clinicians.

CONCURRENT SESSION 4: Memory and Attention in Adults

The Impact of Accelerated Forgetting on Autobiographical Memory in Patients with Partial Epilepsy

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Introduction: Patients with temporal lobe epilepsy show deficits in autobiographical memory, but these are not associated with low scores on standard anterograde memory tests (Lah et al., 2006). We have recently determined that some epilepsy patients show accelerated forgetting when they are asked to recall a word list 1 and 7 days later (Diamond et al., 2008). In this study, we sought to determine whether this difficulty with longer-term consolidation might be related to impairments in autobiographical memory. *Participants and Methods:* From the group of 24 patients with partial epilepsy subsets were selected (a) if they showed accelerated forgetting (AF) on both days (percent recall > 1.5 SD below NC mean; $n = 5$) or (b) if their memory was normal (No-AF) on both days (recall within 1 SD of NC mean; $n = 6$). In a separate testing session, these 11 patients were administered structured autobiographical memory interviews (Levine, Svoboda & Moscovitch, 2005), in which they were asked to recall in detail a particular event from recent (last year) and distant past. The interviews were taped, transcribed and scored. *Results:* There was little difference between the groups in the amount of details recalled from distant autobiographical memories. On the other hand, while the AF group showed tendency to recall a smaller amount of autobiographical details about memories from the most recent compared to more remote events, the No-AF group showed the opposite pattern. *Conclusions:* This preliminary investigation raises the possibility that accelerated forgetting may play a role in autobiographical memory deficits.

Autobiographical Memories and Emotional Recognition in Patients with Frontal Lobe Lesions

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Introduction: Deficits in autobiographical memory (which often contains emotionally salient information) that have been found in patients with frontal lobe lesions have traditionally been attributed to impaired executive skills. It is unknown whether these deficits are also associated with difficulties in emotional processing, which are common in this patient population. *Participants and Methods:* Fifteen patients who had acquired, nonprogressive frontal lobe lesions (7 left, 5 right, 3 bilateral) and 18 age-, sex-, and IQ-matched control subjects participated in the study. All subjects were administered a battery of tests, including tests of emotion recognition (Montreal Set of Facial Displays of Emotion) and autobiographical memory (AMI and Top 5 Emotional Memories). *Results:* Analyses revealed that patients with bilateral frontal lesions recalled a significantly smaller amount of episodic and semantic autobiographical details compared to the control and right frontal lesion groups, and control and unilateral lesion groups, respectively. Moreover, recalled autobiographical episodes were of a significantly lower emotional intensity in all patient groups compared to the control group. The patients with bilateral frontal lesions had significantly reduced emotion recognition accuracy compared to all other groups. Interestingly, in patients, the recall of episodic and semantic autobiographical details as well as the emotional intensity of autobiographical memories correlated significantly with results obtained on the emotion recognition tasks. *Conclusions:* Our study suggests that, in patients with frontal lobe lesions, deficits in autobiographical memory are related to underlying emotional processing impairments. Moreover, patients with bilateral lesions are at a particular risk of deficits in both domains.

Evaluating the Effectiveness of an Everyday Memory Training Program for Outpatients With Neurological Disorders

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Introduction: Memory impairments are frequently found in patients with neurological disorders. However, the effectiveness of memory training remains unclear. *Methods:* Fifty-six patients with stable neurological conditions (aged 21–70 years) completed a memory-training program consisting of six, weekly 2-hour, group-based sessions that provided education and memory strategy practice. The majority had a history of epilepsy (55%) or stroke (34%) and none had signs of dementia. Training effectiveness was evaluated using a waitlist control, cross-over design. Performance was mea-

sured three times, at baseline and at 12-week intervals, using alternate forms of anterograde and prospective memory tests (Rey Auditory Verbal Learning Test [RAVLT] & Richardson-Say Scale of Prospective Memory, respectively) as well as questionnaires assessing everyday memory function (Everyday Memory Questionnaire & Comprehensive Assessment of Prospective Memory). A questionnaire on strategy use was also completed pre- and post-training. *Results:* There were significant training-related improvements in anterograde memory (RAVLT learning, RAVLT delayed recall), as well as on self-ratings of prospective memory and strategy use. In terms of clinical significance, a third of patients demonstrated positive reliable changes. Although factors such as attention and mood were not related to outcome, we found that self-awareness of deficit was predictive of greater training gains. *Discussion:* In summary, our memory-training program had a positive effect on several measures of objective and subjective memory in patients with stable neurological conditions, and particularly in those with accurate self-perceptions.

Efficacy of Methylphenidate in the Rehabilitation of Attention following Traumatic Brain Injury: A Randomised, Crossover, Double-Blind, Placebo Controlled Inpatient Trial

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Introduction: Most previous studies evaluating use of methylphenidate following traumatic brain injury (TBI) have been conducted many years post-injury. This study evaluated the efficacy of methylphenidate in facilitating cognitive function in the inpatient rehabilitation phase. *Methods:* 40 participants with moderate–severe TBI (Mean = 68 days post-injury) were recruited into a randomised, crossover, double-blind, placebo controlled trial. Methylphenidate was administered at a dose of 0.3mg/kg bd and lactose in identical capsules served as placebo. Methylphenidate and placebo administration was randomized in a crossover design across six sessions over a 2-week period. Primary efficacy outcomes were neuropsychological tests of attention. *Results:* No participants were withdrawn due to side-effects or adverse events. Methylphenidate significantly increased speed of information processing on the Symbol Digit Modalities Test (95% CI .30 to 2.95, Cohen's $d = .39$, $p = .02$), Ruff 2 & 7 Test — Automatic Condition (95% CI 1.38 to 6.12, Cohen's $d = .51$, $p = .003$), Simple Selective Attention Task (95% CI –58.35 to –17.43, Cohen's $d = .59$, $p = .001$) and Dissimilar Compatible (95% CI –70.13 to –15.38, Cohen's $d = .51$, $p = .003$) and Similar Compatible (95% CI –74.82 to –19.06, Cohen's $d = .55$, $p = .002$) conditions of the Four Choice Reaction Time Task. Those with more severe injuries and slower baseline information processing speed demonstrated a greater drug response. *Discussion:* Methylphenidate enhances information processing speed in the inpatient rehabilitation phase following TBI. This trial is registered with the Australian New Zealand Clinical Trials Registry (12607000503426).

CONCURRENT SESSION 5: Paeds 1

Childhood Brain Insult: Can Age at Insult Help Us Predict Outcome?

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Introduction: Until recently, the impact of early brain insult (EBI) has been considered to be less significant than for later brain injuries, consistent with the notion that the young brain is more flexible and able to reorganize in the context of brain insult. This study aimed to evaluate this notion by comparing cognitive and behavioural outcomes for children sustaining EBI at different times from gestation to late childhood. *Methods:* Children with focal brain insults were categorised according to timing of brain insult: (1) Congenital ($n = 38$): EBI: 1st to 2nd trimester; (2) Peri-natal ($n = 33$): EBI: 3rd trimester to 1 month post-natal; (3) Infancy ($n = 23$): EBI: 2 months to 2 years post-birth; (4) Preschool ($n = 19$): EBI: 3 to 6 years; (5) Middle childhood ($n = 31$): EBI: 7 to 9 years; and (6) Late childhood ($n = 19$): EBI: after age 10. Children were assessed for intelligence, academic ability, everyday executive function and behaviour. *Results:* Results showed that children with EBI were at increased risk for impairment in all domains assessed. Children sustaining EBI before age 2 years recorded global and significant cognitive deficits, while children with later EBI performed closer to normal expectations, suggesting a linear association between age at insult and outcome. In contrast, for behaviour children with EBI from 7 to 9 years performed worse than those with EBI from 3 to 6 years, and more like those with younger insults, suggesting that not all functions share the same pattern of vulnerability with respect to age at insult.

Developmental Timing of Brain Insult Impacts on Children's Attention

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There is an assumption that the developing brain has a greater capacity to compensate for early brain insult (EBI), a property referred to as *plasticity*. This study aimed to evaluate the plasticity hypothesis by comparing functional outcomes for children with EBI sustained from gestation to late childhood. *Methods:* The sample included 138 children grouped based on developmental timing of EBI, represented by six groups: (1) Congenital ($n = 33$): 1st to 2nd trimester; (2) Peri-natal ($n = 25$): 3rd trimester to 1 month post-birth; (3) Infancy ($n = 19$): 2 months to 2 years; (4) Preschool ($n = 17$): 3 to 6 years; (5) Middle childhood ($n = 28$): 7 to 9 years; and (6) Late childhood ($n = 16$): after age 10. Groups were similar with respect to brain insult characteristics. As expected, seizure history differed between the groups. Children were assessed for a range of attention skills. *Results:* Results showed that children with EBI experienced compromised attention. Children with brain insult before age 3 demonstrated global deficits, while children with brain insult after age 3 performed closer to normal expectations.

Discussion: EBI is associated with increased risk for impairments, with insult before age 3 resulting in poorest outcomes. Our findings show that the developing brain is vulnerable to brain insult, disputing the plasticity hypothesis.

Pre-Injury Characteristics of Children Who Experience Traumatic Brain Injury (TBI) During Childhood

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Introduction: Recovery from TBI in childhood is affected by the characteristics of the child and family. Therefore, accurate information regarding pre-injury child and family characteristics are essential as they may have a significant impact on intervention strategies that are adopted. However, information regarding pre-injury functioning is often collected post-injury and may be affected by a number of biases including the current status of the child, inaccurate recall and feelings of guilt regarding the injury. *Methods:* To overcome these difficulties we used information from a birth cohort of 1265 children, of whom 227 had experienced a TBI event (0–15). Information for these children had been collected prospectively, unrelated to any TBI. Variables that were selected for use in the analysis were those that had previously been found to have an association with TBI and these included: (1) behavioural problems, (2) maternal emotional responsiveness, (3) maternal punitiveness, (4) family exposure to adverse life events, (5) SES of family at time of child's birth, (6) families' standard of living, (7) mother's education status, (8) child's intellectual ability, (9) mother's age, (10) gender of the child. *Results:* Using Cox Regression and Receiver Operating Characteristic (ROC) analyses, we examined how well these variables predicted a TBI event. Results indicated that gender of the child, high levels of family stress and a punitive parenting style were most predictive of a TBI event. *Conclusions:* Intervention strategies aimed at aiding recovery following childhood TBI must consider stresses in the family and parental coping style in order to be maximally effective.

Premorbid Child and Family Functioning as Predictors of Postconcussive Symptoms in Children With Mild Traumatic Brain Injuries

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Introduction: This study sought to determine whether mild traumatic brain injury (TBI) during childhood results in post-concussive symptoms (PCS) more often than mild orthopedic injuries (OI), and whether premorbid child

and family functioning moderates or explains any group differences in PCS. *Methods:* This prospective and longitudinal cohort study included 8 to 15 year old children, 186 with mild TBI and 99 with mild OI, who were recruited from consecutive admissions to Emergency Departments in two large children's hospitals. Parents and children rated current PCS within 3 weeks of injury and at 1, 3, and 12 months post injury. At baseline, parents also provided retrospective ratings of pre-injury symptoms, as well as of child behavioral adjustment, overall family functioning, and other stressors and resources in the family environment. *Results:* Mixed models indicated that children with mild TBI reported more PCS than those with OI, as did their parents, even after taking into account premorbid child and family functioning. Group differences were moderated by premorbid child and family functioning, such that they were more pronounced among children with better premorbid adjustment, from higher functioning families, and from families with more environmental resources. *Discussion:* Children with mild TBI are more likely than children with mild OI to display PCS. These effects are more evident in higher-functioning children and families. Higher-functioning children may be more sensitive to the effects of mild TBI, or the effects may be more difficult to differentiate from other causes of PCS in lower-functioning children.

CONCURRENT SESSION 6 – Emotion and Mood 2

Facilitating Adjustment After Traumatic Brain Injury

Anne Marie Sarandrea
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Psychological adjustment to severe traumatic brain injury and its sequelae predicts longer-term outcomes but this is often complicated by the pre-existing psychological status of the individual. The focus will be a client of the Westmead Brain Injury Rehabilitation Service who presented with denial of disability, marked irritability, suspiciousness and paranoid thinking. This paper will describe psychological intervention that included the use of motivational enhancement techniques to aid improvement in the awareness of psychological issues, to develop coping skills, and to facilitate the involvement of family members in the eductional process. There was an improvement in the client's psychological awareness, a reduction in irritability and overall improvement in their psychological adjustment. The importance of the therapeutic relationship in engaging and treating clients with emotional, behavioural and personality changes postinjury over a long period of time will be discussed along with the use of psychological techniques modified to allow for cognitive impairment.

Treatment for Apathy Syndrome Following Traumatic Brain Injury (TBI)

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Apathy is defined as a deficiency in cognitive, behavioural and emotional components of goal-directed behavior. This is a common occurrence after neurological damage, occurring in up to 71% of the TBI population. The impact of apathy is widespread, negatively effecting rehabilitation, vocational outcome, independence and family burden. Despite this, evidence for treatments targeting apathy following acquired brain injury is sparse. This Phase 1 study aimed to evaluate a treatment for apathy within the TBI population. A 32-year-old male who had sustained a severe TBI underwent treatment over 7 months. On assessment, he had average intellectual functioning, with a marked deficit of drive in the absence of emotional distress. He initiated, but would rarely sustain activity. This focused program targeted components of apathy through motivational interviewing and cognitive rehabilitation techniques. Treatment progress was measured through a multiple-baseline, single case experimental design. Results indicated the efficacy of this program. It is argued that for the apathetic client the combination of external compensation and ongoing motivational interviewing to encourage change is essential to success. Comprehension of the direction and intended outcome of activity assists in the initiation of action. However, in order to sustain this activity it is vital to segment into small, easily manageable steps. Furthermore, it is necessary to address all three components of apathy (behavioural, cognitive and emotional) simultaneously in order to sustain and maintain benefits of treatment.

The Integration of Motivational Interviewing and Cognitive Behaviour Therapy to Treat Anxiety Disorders Following Traumatic Brain Injury (TBI)

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Introduction: Recent Australian studies show that approximately 38% of individuals with moderate-severe TBI develop anxiety disorders within the first five years post-injury, and that the presence of anxiety significantly affects psychosocial outcomes. While psychological interventions such as cognitive behavioural therapy (CBT) are the preferred choice of treatment, CBT's efficacy in treating anxiety disorders has been demonstrated in an only handful of studies involving a small number of individuals with mild or moderate TBI. This study aims to develop and evaluate a CBT-based anxiety treatment program adapted for a community sample with moderate-severe TBI. It also aims to evaluate the application of Motivational Interviewing as preparatory intervention, focusing on increasing motivation to change and engagement in treatment. *Methods:* Participants with moderate to severe TBI, aged 18 to 60 years, are being randomly assigned to three treatment conditions, to evaluate the relative effectiveness of (1) CBT with 3 additional sessions of MI (MI+CBT) as compared with (2) CBT only and (3) treatment as usual (Control). Assessment includes a structured clinical interview to determine psychiatric diagnoses; self-report measures of anxiety, depression, psychosocial functioning and coping style; and measures of premorbid intellectual functioning, memory and executive functions. *Results:* The study is in progress. Preliminary outcome data and observations from individual case studies will be presented at the conference. *Discussion and conclusion:* The study results will inform clinical practice by providing evidence about relative effectiveness of interventions for individuals with TBI who suffer from anxiety.

Investigation of a Brief Intervention to Minimise Alcohol Use Following Traumatic Brain Injury (TBI)

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Introduction: Pre-existing problems with alcohol abuse are common among survivors of traumatic brain injury (TBI) and continued alcohol consumption post-injury has been linked with poorer outcomes. Within the addiction literature, brief interventions based on a motivational style interview have been found to be successful in reducing alcohol use. However, there has been little research examining the effectiveness of such interventions in TBI individuals. *Method:* This study has used a randomised controlled trial (RCT) to examine the effectiveness of a brief motivational intervention in reducing alcohol consumption post injury. The study aims to examine factors associated with a positive response to the intervention, as measured by a greater reduction in alcohol use 6 months post-intervention. *Participants:* 40 participants from the Epworth Rehabilitation Centre, who have sustained a moderate to severe head injury 6 to 9 months previously, have so far been randomly allocated into an intervention, information only, or non-intervention group. In the initial assessment, information regarding alcohol and drug use, readiness to change behaviour, levels of depression and anxiety, cognitive functioning, and functional status have been collected. Follow-up assessments have been conducted approximately 6 months after the first assessment session. *Discussion:* At the moment, there seems to be a promising trend in that the intervention appears to be having an impact on both the quantity and frequency of alcohol consumption. Should this study reveal that such a brief intervention is useful in reducing alcohol use following TBI, it could be introduced as standard practice and hopefully provide individuals with a better chance of optimal recovery and quality of life.

Impaired Interpretation of Facial Expression After Traumatic Brain Injury: Exploring the Role of Visual Scanning

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Introduction: As a result of neurological damage, interpretation of facial expression may breakdown at various stages of processing from encoding the stimulus through to accessing semantic information. Visual scanning and feature extraction underpin the encoding process and enable the generation of an adequate percept for subsequent processing. Although visual scanpaths to facial expressions have been examined extensively in non-patient groups and in individuals with schizophrenia, social phobia and focal amygdala damage, this is not the case in individuals with TBI. In this study, our objective was to investigate eye movements in an individual with impaired ability to interpret facial expression subsequent to TBI. *Method:* Participants were one adult male (LY) with impaired ability to interpret facial expression as a result of severe TBI and 3 neurologically normal male controls. Stimuli were 18 pictures of facial expressions depicting the six basic emotions (sadness, happiness, anger, surprise, fear and disgust). The Tobii 1750 binocular infrared eye tracker (Tobii Technology, Stockholm, Sweden) recorded eye movements as participants viewed stimuli displayed on the eye tracker monitor. *Results:* LY's pattern of scanning differed significantly from that of the neurologically normal controls. For the controls the majority of fixations fell in the internal facial region bounded by the eyebrows and the mouth. In contrast, LY's scanning was more dispersed and he frequently focused on external peripheral regions (hair, ears, forehead). *Discussion:* These results indicate that in some cases impaired visual scanning (implying an apperceptive mechanism) contributes to impaired interpretation of facial expression after TBI.

Disorders in Recognition of Emotion in Speech After Traumatic Brain Injury: Quality Versus Content

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Introduction: Adults with traumatic brain injury (TBI) are often concrete and literal when understanding conversational remarks. They are also poor at detecting the emotional quality of speech prosody. This study was designed to examine whether people with TBI have a bias towards processing semantic information (the 'what') and therefore ignore emotional prosody (the 'how'). *Method:* Eighteen individuals with moderate-to-severe TBI and 18 age- and education-matched controls completed two vocal emotion discrimination tasks presenting a combination of sentences that varied in the amount of semantic information provided: (1) spoken in well-formed English, (2) using a nonsense language, and (3) low-pass filtered to produce 'muffled' voices. *Results:* The TBI group showing significantly poorer emotion discrimination for nonsense and filtered sentences relative to the control group. Within the TBI group impairment was greater when accessing semantic memory to label sentences as 'angry', happy', 'afraid' or 'surprised', compared to simply making 'same' or 'different' judgements between pairs of stimuli. In addition, performance accuracy was found to be significantly related to the ability to inhibit prepotent responses. Together these findings suggest that adults with TBI are heavily reliant on the 'what', rather than the 'how', when judging emotional information in conversational remarks.

CONCURRENT SESSION 7: Experiences

The Courage to Care

Cheryl Koenig
Carer, Australia

Aim: Provide clinicians with a greater understanding of carer/family needs and perspectives whilst they navigate dramatic life changes in family structure and function following ABI. Also discuss the importance of community participation. *Background:* My son sustained an extremely-severe-traumatic-brain-injury 11 years ago when he was hit by a car. Statistically — GSC of 3; coma for 6 weeks; PTA for over 10 months. Naturally he was given a very poor prognosis. However, with the combination of good therapy, sheer determination, family and community support, he now not only walks well, but can run, snow-ski, play the piano, tennis, swim laps and is learning to drive — all this while working in 4 part-time jobs, 5 days a week.

I became a consumer representative over 4 years ago for the GMCT with the intent of being involved in the development of policy and health care services in the area of brain injury. During this time I have written 2 booklets for NSW Health, which involved interviewing a diversified range of people with a TBI and their carers. From personal experience in the extensive rehabilitation of my own son, along with gaining a wealth of insight through interviewing many carers/consumers, I am able to contribute a wide reflection of consumer perspectives that would be beneficial in any discussion relevant to improving the lives of those afflicted with brain injury. I intend to discuss the importance of adopting a 'team-care focus' that is inclusive of family (at both the inpatient and outpatient level); how clinicians can improve the critical Transition Period (i.e., transition from the safe environment of the hospital into the often intimidating community environment); and also highlight the significance of early social integration through active community participation.

Acquiring Better Insight into Acquired Brain Injury: Investigating What It's Like to Have ABI and Searching for Answers

Christine Yvonne Durham

Health Science/Education RMIT University, Australia

Many people, including myself, have their world turned upside down by acquired brain injury (ABI). This research addresses how these people cope with ABI for the rest of their lives, the understandings and actions they use to help themselves. 'Keys to the ABI' cage represents both a metaphor through which people with ABI can explore their experiences and 'getting better', as well as a methodological tool for examining their experience and both commonality and diversity of the collective ABI experience. Into the cage, literally a bird-cage, participants will place a series of 'talking cards' or objects (similar to Cameron and Murphy's 'talking mats', 2002) to express difficulties/losses, emotions/experiences and events/people/self-talk that has helped them cope. The Cage will assist reflection, address issues of power, shame because of deficits, memory and communication difficulties. As a research method the approach fixes on the phenomenological life-world as experienced by each person with ABI, searching for that which, for them, is of essence to that experience. It therefore resists both the objectifying nature of scientific approaches and rehabilitative models of treatment whilst providing a personal resource for empowerment. By uncovering the phenomenological heart of ABI, learning how the person with ABI comes to terms with their new, foreign 'self', information gained will be used in the development of an easy to read educational information resource. This will help PWABI help themselves to feel and fare better; family carers to understand and cope better, and professionals to better perceive the phenomenon of ABI so they can better assist their clients.

Family Goal Planning and the Rehabilitation Process: What is Important to Families?

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and Jane Edwards[1]

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Introduction: The Family Goal Plan (FGP) is a process that facilitates collaboration with families to set rehabilitation goals and to ensure that therapy programs are meaningful to the family and child. The FGP provides an opportunity to implement key components of family-centred care, emphasizing a partnership between families and service providers allowing families to make decisions about priorities for therapy in conjunction with the team. *Aims:* To identify rehabilitation goals of primary importance to children and families and to determine patterns of family identified goals following paediatric brain injury. *Methods:* Data will be analysed qualitatively to identify patterns of goals identified by families during inpatient rehabilitation from March 2008 to March 2009. Goals will be described in relation to ICF domains, and analysed to determine individual trends during inpatient rehabilitation, and to identify common themes amongst the full cohort of children and families. *Results:* Data collection for this project is ongoing. Preliminary analysis suggests that the focus of goals changes throughout the time spent in rehabilitation, with a shift from body structure and function level goals, to those focusing on activity and participation. *Discussion:* The results of this project assist in understanding families' priorities during rehabilitation. Understanding this enables therapists to target family support and education to enhance family participation in their child's rehabilitation. Future studies need to investigate the relationship between FGP and measures of family adaptation and adjustment. Further investigation of whether FGP enhances family participation and satisfaction with both in and outpatient rehabilitation services is also recommended.

Factors Underlying Caregiver Stress in Frontotemporal Dementia and Alzheimer's Disease

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Introduction: Frontotemporal dementia (FTD) has devastating effects on patients and caregivers, yet the factors underlying caregiver stress are poorly understood. *Methods:* 108 caregivers (79 = FTD, 29 = Alzheimer's disease) participated in a postal survey. Self-report measures of perceived stress, depression, social networks, as well as patient-based measures of behaviour change and activities of daily living were completed. *Results:* Depression was a cardinal feature in FTD caregivers, and it accounted for more than 58% of stress scores. Both depression and stress were significantly higher than in AD. Neither the severity of behaviour changes nor functional disability explained caregiver stress. *Discussion:* Caregiver stress is a multidimensional construct, and FTD caregivers should receive more support than it is currently available. Depression plays a key role in coping ability.

Factors Influencing Use/Non-Use of Respite/Replacement Care by Carers of Adults With Acquired Brain Injury

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Introduction: Respite/replacement care services are a vital source of support for family carers of people with acquired brain injuries (ABI), but may be hard to access. Reasons for this are not fully understood. To inform a UK-wide study to support future service development, carer perceived barriers to this type of care were examined in an ABI population. *Methods:* In a questionnaire survey, 222 carers (spouse/partners 61%, parents 37%; females 81%) of adults (males 72%) with TBI (49%), strokes (26%), brain infections (18%), other (7%) documented services used by the person cared for during the previous 6 months and responded to questions about experiences of service receipt. Pooled responses were thematically coded and grouped into key topic areas. *Results:* Fewer than half of the carers (45%) reported receipt of any type of replacement care service. One in six (16%) reported receiving respite with a third (29%) reporting short day care placements. Respite was cited as the greatest unmet need by one in five (21%) carers. Carer perceived reasons for non-use of services comprised (a) objections raised by the person cared for, (b) carers' concerns about quality of care, (c) staff being ill equipped to manage complex problems (d) access to suitable services hindered by geographical or financial constraints. *Discussion:* Findings highlight the need to provide high quality flexible services appropriate to individual needs and circumstances; this may include home-based respite. Implementing staff training in managing complex problems associated with ABI could increase respite/replacement care options and help to sustain carer wellbeing.

Successful Community Discharge Following Prolonged Hospital Admission for Individuals With Acquired Brain Injury: How Can We Improve the Process?

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Introduction: Effective discharge planning is an essential component of health care systems throughout the world. Despite this, facilitating successful community discharge is often problematic, especially for individuals with acquired brain injury (ABI) who experience prolonged periods of hospital admission. *Objectives:* (1) To explore the experiences of individuals with ABI during the process of discharge to the community following prolonged hospital admission; and (2) To investigate factors contributing to successful community discharge following prolonged hospital admission after ABI. *Method:* A qualitative case-study design was utilised to explore the experiences of five individuals with ABI during the process of discharge to the community following prolonged hospital admission. Data collection entailed mapping the experiences of participants during the first 6 months post-discharge using a set of five templates. The process of data analysis involved reviewing all completed templates to describe participants' experiences and collectively categorise factors identified as contributing to successful community discharge.

Results: The unique experience of each participant is described in an in-depth narrative form to emphasise the 'lived experience'. Furthermore, the data analysis process highlighted 10 key factors/themes which were found to influence successful community discharge following prolonged hospital admission. The identified factors/themes address the following areas: formal service/support needs, informal networks of support, the impact of injury related deficits, psychological adjustment and goal attainment. *Discussion/Conclusions:* The findings highlight several areas in which current service provision could be improved to enhance outcomes for individuals with ABI who are discharged to the community following prolonged hospital admissions.

CONCURRENT SESSION 8: Adult Neuro

Measuring the Effectiveness of a Neuropsychological Assessment for the Client With Multiple Sclerosis and Their Carer: Its Impact on Body Structure, Activity/Participation, and Environment

Wendy Longley[1] and Robyn L. Tate[2]

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The effectiveness of neuropsychological rehabilitative interventions for neurologically impaired populations has been investigated in the scientific literature over recent decades. However, the effectiveness of the neuropsychological assessment, feedback and advice process, alone, as a form of therapeutic intervention in its own right has received little attention. While there is some evidence that neuropsychological assessment is indirectly beneficial to a range of health professions for case conceptualisation and for the planning of treatment and care of their patients, the direct therapeutic benefit to those patients remains largely unsupported. Only a few studies have investigated the direct benefits of a neuropsychological assessment for neurological clients and their carers (or in the case of paediatric patients, their parents), and only two randomized control trials have been published. The results have been disappointing to date, with no benefits being found for the clients and either nil or minor benefits for the carers. But were these studies using suitable, psychometrically sound tools and methodologies? And were they measuring relevant aspects of the patients' functioning as the focus of their 'outcomes'? Evaluating the effectiveness of neuropsychological assessment for people with multiple sclerosis and their carers has many advantages that will help advance our knowledge in this area. This presentation will outline the advantages of studying this issue within this particular population. Outcome tools showing the most psychometric and clinical promise will be described, and the conceptual fit of these tools within the Body Structures, Activities/Participation, and Environmental domains of the ICF framework will be discussed.

Behavioural Changes in Motor Neurone Disease

Patricia Lillo, Sharon Savage, Olivier Piguet and John R. Hodges

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Introduction: Motor Neurone Disease (MND) has traditionally been considered a pure motor syndrome which spares aspects of cognition and behaviour, although in recent years it has been suggested that up to 50% of patients with MND may develop frontal dysfunction which in some cases is severe enough to reach criteria for Frontotemporal Dementia. Behavioural changes, emotional lability and impaired social cognition are part of the clinical spectrum but estimates of the frequency of presentation remain unknown. The aim of this study was to identify the pattern of behavioural changes in MND patients and the potential impact on carer burden. *Methods:* 130 MND patients and carers agreed to participate in a postal survey conducted across New South Wales. The survey contained questions about demographic data, clinical symptoms, the Self-Administered ALS Functional Rating Scale-Revised (self ALSFRS-R) and questionnaires investigating neuropsychiatric symptoms: the Cambridge Behaviour Inventory (CBI-R), the Interpersonal Reactivity Index (IRI), The Zarit Burden Interview and the Depression, Anxiety and Stress Scale (DASS). *Results:* Preliminary analyses suggest a high prevalence of behavioural changes in MND patients, principally involving motivation together with a loss of patient judgment and insight.

Emotion Processing Disturbance in Frontotemporal Dementia: A Preliminary Study

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Background: Emotion processing is significantly disrupted in frontotemporal dementia (FTD), particularly in patients with behavioural presentation (bvFTD) or with semantic dementia (SD), but less so in patients presenting with progressive nonfluent aphasia (PNFA). Existing literature reports greater emotion recognition impairment for negative (e.g., anger, disgust) than for positive emotions. It remains unclear, however, which of the processes required for optimal emotion processing and recognition are disrupted (e.g., face detection, affect recognition, emotion labelling). *Methods:* FTD patients (bvFTD, SD, PNFA) and aged-matched healthy controls participated in four tasks of emotion processing involving static visual stimuli: face perception, identification discrimination, affect discrimination and affect selection. *Results:* Overall, FTD patients were significantly impaired on all tasks compared to healthy controls. Analyses on the FTD subgroups, however, revealed that the reduced performance was almost exclusively mediated by the bvFTD group. Within this group, ≥ 50% of patients scored at least 2 standard deviations below the mean score of healthy controls on each task. In contrast, most SD and PNFA patients performed within normal limits. *Discussion:* These preliminary results indicate that within FTD, bvFTD patients appear most sensitive to emotion processing disturbance. In addition, the deficits in emotion processing may be caused by a breakdown in processing visuospatial information, as much as by a deficit in high-level emotion integration. Future research will examine the relations among these components involved in the recognition of facial emotions.

Executive Function in Progressive and Nonprogressive Behavioural Variant Frontotemporal Dementia

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Introduction: Recent studies suggest that behavioural variant frontotemporal dementia (bv-FTD) patients differ in their prognosis with fast-progressing and very slow-progressing cases. We investigated executive and behavioral profiles of progressive and nonprogressive bv-FTD patients to establish diagnostic markers discriminating the two groups. *Methods:* A range of neuropsychological and behavioural tests were used. Mean overlap-based statistical analyses and logistic regression analyses were performed to distinguish progressive from nonprogressive bv-FTD cases. *Results:* Although progressors and nonprogressors showed similar behavioural profiles, they were distinguishable by their performance on executive tasks. The nonprogressors' performance on all tests was with the normal range, whereas the progressors were consistently impaired on four tests: Digit Span Backward, Hayling Test of inhibitory control, Letter Fluency, and Trails B. Logistic regression showed that 86% of patients could be classified on the basis of Digit Span and Hayling subscores. *Discussion:* Contrary to some prior reports, behavioural variant frontotemporal dementia (bv-FTD) patients who progress over time are typically impaired on executive tasks at first presentation, although an important minority of true FTD patients perform normally. Previous inconsistencies are explicable by the mixture of patients with progressing FTD and phenocopy cases.

Distinguishing Language Profiles in Progressive Aphasia: Introducing the SYD-BAT

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Background: Progressive language disturbances in neurodegenerative conditions include Progressive Non Fluent Aphasia (PNFA), Semantic Dementia (SD), and Logopenic Progressive Aphasia (LPA). These aphasic disorders arise from a breakdown in different levels of processing, such as word retrieval, motor speech production, or understanding of words. Existing tests of single word processing have had limited success in differentiating these clinical presentations. In part, this is due to the use of different stimulus items to assess each language process, and a scarcity of Australian norms. The Sydney Language Battery (SYD-BAT) was developed to address these limitations, by combining measures of language processing into one instrument. *Method:* We designed four tests that use the same target words: (1) Picture Naming, (2) Word Repetition, (3) Word-Picture Matching, and (4) Semantic Association. Following extensive piloting, 30 target words were selected. These words were multi-syllabic, highly imageable nouns, of decreasing frequency, graded into three levels of difficulty. Performance on the SYD-BAT was compared between patients with progressive language disturbance and age-matched healthy controls. *Results:* A clear separation of SD from other aphasic types was evident. The distinction between PNFA and LPA subtypes appears more challenging. Emergent evidence suggests, however, that PNFA patients may be more

affected by word frequency than LPA patients. *Discussion:* Preliminary data suggest that the SYD-BAT is able to distinguish different language profiles among patients with progressive aphasia. Future research will formally evaluate the reliability and validity of this instrument.

Associations Among Cognitive Status, Psychosocial Adjustment and Quality of Life in the Context of Brain Tumour

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A brain tumour is a serious condition which combines the characteristics of both cancer and acquired brain injury. The present study aimed to investigate the associations among emotional status, cognitive ability, coping, social support and quality of life (QoL). Participants included 30 adults with a brain tumour (60% benign, 40% malignant) who were aged 28 to 71 years and were on average 5.4 years post-diagnosis (SD = 5.6 years). Measures included a brief battery of neuropsychological tests (IQ, attention, memory and executive function) and self-report measures of emotional status (Depression, Anxiety Stress Scale), coping (COPE), social support (Brief Social Support Questionnaire), and QoL (Functional Assessment of Cancer Therapy). Correlational findings identified that Qol was significantly associated with emotional status (r = –.53–.69, p <.005), global cognitive ability (r =.49, p < .01), coping (r = .41, p < .05), and satisfaction with support (r = .38, p < .05). After controlling for global cognitive ability, level of stress and satisfaction with support significantly predicted quality of life (R^2 =.65), and use of planning as a coping strategy predicted level of depression (R^2 =.35). These exploratory findings highlight the role of personal coping and social support in adjustment and QoL, thus identifying priority areas for psychosocial intervention following diagnosis of brain tumour. Potential intervention approaches will be discussed.

CONCURRENT SESSION 9: Paeds 2

The Development of an Evidence-Based Early Injury Pathway (EIP)

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Children and infants who have suffered a brain injury (BI) are at high risk of developmental delay, behavioural difficulties, speech and language, and cognitive and learning difficulties. This is in spite of often appearing symptom free on discharge from hospital. Literature reviews and clinical experience indicate that children injured at a young age, regardless of the mechanism, require scheduled formal follow-up procedures. The multidisci-

plinary rehabilitation team at Sydney Children's Hospital (SCH) set out to investigate and develop an appropriate evidence-based early injury pathway (EIP) for children who have sustained a BI in the early years of life. Children admitted to SCH, who have sustained a BI under the age of 5 years, will have a baseline assessment completed by our team. This will include an age appropriate evaluation of their development, including physical skills, self-care, communication, social and play skills, learning (attention and cognition), and behaviour. The family will be provided with a 'Parent Held Record'containing information about the EIP and details of the follow up program. Multidisciplinary clinic reviews will be scheduled when the child is 4, 8, 12 and 18 months (corrected/adjusted age) and 2, 3, 4, 5 and 6 years of age. Specialist support and advice will be provided by our doctor, physiotherapist, occupational therapist, speech pathologist, clinical psychologist and social worker. Results of our assessments will ensure timely referrals to appropriate services in the child's local community. Frequent review of these vulnerable children will also establish our relationship with the family and will allow early identification of issues and difficulties that may arise facilitating early intervention and improved outcomes.

Craniosynostosis: Neurodevelopmental Functioning in Infants Prior to Surgical Intervention

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Introduction: Single-suture craniosynostosis (SSC) is a common developmental disorder that is characterised by premature fusion (typically in utero) of one of the sutures separating the bones of the skull. This condition results in distorted and restricted growth of the underlying brain and cranial reconstructive surgery is typically indicated to improve normal brain growth potential. These conditions carry a well-documented risk of neurodevelopmental delay. However, the nature, extent, and associated risk factors of neurodevelopmental delay in SSC are not well understood. This study sought to investigate neurodevelopmental functioning in infants with untreated ICS. Predictive factors for developmental status, including psychosocial, genetic and cranial morphology, were explored. *Methods:* Forty infants with untreated SSC aged 5 to 16 months (M = 9.5, SD = 3.0 months) were assessed on the Bayley Scales of Infant and Toddler Development — 3rd edition (BSID-III). Genetic, cranial morphology and social risk data were also collected. *Results:* Infants with untreated SSC displayed significantly poorer gross motor skills than the normative population ($p < .001$). Performance in all other neurodevelopmental domains (cognition, language, fine motor abilities, social-emotional, behaviour) was commensurate with normative sample estimates. The relative contributions of social risk, genotype and cranial morphology are presented. *Discussion:* At a broader clinical level, infants with untreated SSC have significantly poorer gross motor abilities than their non-afflicted peers, whilst other developmental skills at this stage of development appear in keeping with normative population estimates. These findings demonstrate that early onset brain insult is associated with detrimental developmental sequelae in the early infancy phase.

Craniosynostosis: Neuropsychological Outcomes During Late Infancy and Early Childhood Following Surgical Intervention

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Introduction: Single-suture craniosynostosis (SSC) is a congenital skull deformity characterised by restricted and distorted cranial growth due to premature fusion (typically in utero) of one of the sutures separating the cranial bones. This disorder compromises normative brain growth processes during a critical phase of early development. Cranial vault expansion and remodelling is performed in most cases to improve brain growth capacity and cosmesis. There is increasing empirical evidence that infants with SSC display developmental delays prior to surgical intervention. It remains controversial as to whether these delays persist thereafter. There is also very limited scientific literature on the longer-term developmental outcomes in this population. This study will investigate the early and long-term neuropsychological sequelae of SSC at two time-phases; during late infancy (post-treatment) and early childhood. Risk factors for neuropsychological outcome (age at surgery, operative and nonoperative management) will also be examined. *Methods:* Forty-three infants with surgically repaired SSC aged 13 to 41 months (M = 22.6, SD = 5.7 months) were assessed on the Bayley Scales of Infant Development-2nd edition. Twenty children aged 3 to 6 years (M = 4.6, SD = 1.1 years) with surgically repaired SSC were assessed on age-appropriate measures of general intelligence (IQ). *Results/Discussion:* Infants with SSC displayed significantly lower cognitive (p < .001) and motor (p < .001) abilities than normative population averages. Children with SSC displayed significantly lower intellectual skills (IQ) than the normative population (p < .05). Findings suggest that early-onset brain growth disruptions have detrimental neuropsychological sequelae during infancy, of which persist into the early childhood years.

Developmental Outcomes of Infant Cardiac Surgery

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Introduction: Infants who have cardiac surgery are at risk of developmental delay. There have been many advances in the medical and surgical management of infants with cardiac anomalies, which may influence the outcome of these children. *Method:* This study was conducted at The Royal Children's Hospital in Melbourne, Australia. Infants (n = 97) who had cardiac surgery in the first three months of life were recruited. Parents completed the study questionnaire and were interviewed one month after discharge from hospital. A smaller group (n = 36) were followed up one year post hospital discharge. At the one year follow up parents completed the study questionnaire and interview. A developmental assessment of the child, using the Bayley Scales of Infant and Toddler Development -III, was

also conducted. *Results:* Mean scaled scores for: Cognitive; Language (Receptive and Expressive Communication); Fine Motor; and Social-Emotional indices were within the Average range. However, the mean scaled score on the Gross Motor index was 7.47 (range 2–13), placing it in the Low Average range. Thirteen of the 36 infants (36%) performed below age expectations on the Gross Motor index. This was dramatically different compared to the other indices; Cognitive 3/36 (8%), Receptive Communication 4/36 (11%), Expressive Communication 5/36 (14%), Fine Motor 2/36 (6%). Risk and predictive factors (in particular medical factors and maternal well being) will also be explored. *Discussion:* Our findings suggest that routine follow up of infants who have cardiac surgery should incorporate an evaluation of their development.

Functional Outcomes and Parent–Child Concerns Following Paediatric Stroke

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Introduction: Paediatric stroke has a reported incidence rate of 6/100,000 (Lynch, 2004), and of these children, it is projected that half will demonstrate ongoing neurological disability that will impact on their ability to complete self-care, mobility and communication tasks in daily life. This pilot study aimed to:

- investigate the PEDI as a measure of functional abilities
- measure changes in children's functional abilities from acute time of stroke to 3 months follow up
- describe the functional abilities of children ≥ 3 months poststroke and
- identify functional concerns for children and parents following stroke.

Methods: A total of 28 children were invited to participate. Functional abilities were measured using The Pediatric Evaluation of Disability Inventory (PEDI). Child and caregiver goals were identified using either The Canadian Occupational Performance Measure (COPM) or the Perceived Efficacy and Goal Setting System (PEGS). *Results:* Children who had sustained strokes showed functional abilities that were below age expectations up to 4 years post-stroke. Children made clinically significant change in self-care and mobility skills during the first 3 months following stroke, but showed slower rates of change in social function. Parents and children identified a range of concerns across all domains of function. Children typically identified concerns related to leisure and social interaction, whereas parents concerns were related to school performance and self care. *Discussion:* Based on this preliminary evidence, consistent clinical use of the PEDI at acute and follow up assessment is recommended. Future studies need to link functional outcomes to diagnostic information to provide a better understanding of children's recovery following stroke. For clinicians, the use of client-centred measures such as the COPM and PEGS is recommended to better understand the impact of stroke on children and families.

Development and Validation of the Paediatric Care and Needs Scale (PCANS) for Assessing Support Needs of Children and Youth With Acquired Brain Injury

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Introduction: The Paediatric Care and Needs Scale (PCANS) is a newly developed scale that assesses support needs following childhood acquired brain injury (ABI). This paper describes the development of the PCANS and examines its concurrent and construct validity. *Methodology:* Participants were 32 parents/caregivers of children with ABI aged 5 to 18 years recruited from the Brain Injury Rehabilitation Programs of the Childrens Hospital at Westmead and Sydney Children's Hospital. Concurrent validity was examined by comparing the PCANS with other measures currently used for children with ABI – Functional Independence Measure for Children (WeeFIM) and Vineland Adaptive Behavior Scales (VABS). WeeFIM and VABS subscales that tap similar and dissimilar constructs to the PCANS were further used to investigate convergent and divergent validity respectively. Discriminant validity analysis comprised comparing PCANS scores between groups dichotomised by adaptive functioning (VABS-total) and overall outcome (King's Outcome Scale of Childhood Head Injury [KOSCHI]). *Results:* Concurrent validity was shown with moderate correlation coefficients found for PCANS support intensity scores with most WeeFIM and VABS variables ($r_s = -.46$ to $-.77$, $p < .01$). Some evidence for convergent and divergent validity was also found. For example, correlation coefficients between PCANS self-care items against WeeFIM self-care and motor subscales were moderately high ($r_s = -.64$ and $-.63$, $p < .01$); whereas the coefficient between PCANS psychosocial and Wee-FIM self-care items was low ($r_s = -.29$, NS). In terms of discriminant validity, PCANS support intensity scores were able to distinguish groups dichotomised by VABS-total and KOSCHI data ($p < .01$). *Conclusions:* These findings provide preliminary evidence for the validity of the PCANS for assessing support needs after paediatric ABI.

CONCURRENT SESSION 13: Social Roles

Promoting Positive Sexual Development Among Children and Adolescents With Acquired Brain Injury

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Positive sexual growth is a key developmental challenge for all children and adolescents. An acquired brain injury (ABI) can create major hurdles in achieving this goal. The published literature on the topic is scarce, comprising a small number of case reports about precocious puberty, a few case studies documenting various treatments for sexual behavioural disturbance

and little else. One consequence of this limited evidence base is the relative absence of guidelines, treatment interventions and resources to support clinicians, family members and the children/adolescents themselves in seeking to attain positive sexual development after ABI. A conceptual model will be outlined that suggests the major mediating factor in achieving sexual growth is the ability to form successful peer relationships. Six domains are highlighted that can influence the possibility of positive sexual development, namely: (1) social competence versus social isolation, (2) individuation and independence versus dependence, (3) physical development versus physical challenge, (4) informed and educated about sexuality versus uninformed and uneducated, (5) sexually experienced versus sexually inexperienced, and (6) sexually appropriate behaviour versus sexually inappropriate behaviour. Drawing upon the broader literature on sexual adjustment after disability/chronic illness, and the clinical experience of the authors, a range of issues and challenges in each of these six domains will be outlined, as well as possible approaches to intervention.

The Impact of Communication Impairment on Social Living after TBI

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Introduction: The ability to communicate effectively has been described as central to developing and maintaining relationships. Nevertheless, we know surprisingly little about the specific role that communication outcome plays in developing and maintaining social relationships following TBI. The aim of this study was to explore directly the impact of communication impairment on outcome in the domain of social relationships. *Method:* A mixed quantitative–qualitative methodology was used to understand the relationship between communication and social integration. Thirty-one TBI participants (22 men, 9 women) with 31 close others (12 mothers, 4 fathers, 8 wives, 3 husbands, 4 sisters) were interviewed and completed the R-CHART and the La Trobe Communication Questionnaire (LCQ). TBI participants had all sustained severe injuries (PTA mean 33.5 ± 16.7 days) and were living in the community at the time of interview (mean 2.7 ± 0.5 years after injury). They were aged between 17 and 48 years at the time of injury. Transcribed interviews were coded and analysed using principles of grounded theory. *Results:* Both self and close other scores on the LCQ made a significant contribution to prediction of social integration. Further, there was striking overlap between the qualitative and quantitative findings that shed considerable light on the nature of communication behaviours that have a negative impact on developing and maintaining social relationships. *Discussion:* The results highlight the importance of social communication in facilitating participation in the community and building relationships to support ongoing emotional adjustment. In addition, the findings provide clinicians with specific avenues for intervention.

Perceived Communication Ability Can Be Improved By Training Communication Partners of People With Traumatic Brain Injury (TBI)

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Introduction: Communication problems following TBI can contribute to socially inappropriate behaviour, causing lost relationships, unemployability, and social isolation. Two treatments have been shown to improve communication in people with TBI: (1) social skills training for the person with TBI alone and (2) training communication partners to deal with difficult communication behaviours. However, no research has concurrently compared these approaches. This paper reports preliminary data of a controlled group comparison study that aims to determine which of these approaches is more effective compared with a delayed treatment control group. *Method:* 44 participants with severe TBI and their everyday communication partners (ECP) participated. Based on ECP availability, participants were allocated to one of the three groups: a SOLO group (where only the person with TBI was trained), a JOINT group (both the ECP and the person with TBI were trained together), or a CONTROL delayed treatment condition (ECP attended with their relative with TBI). Treatment for all groups involved training in strategies to maximise communicative effectiveness. The Latrobe Communication Questionnaire (Douglas et al., 2000), completed by both the person with TBI and ECP, was used to measure perceived communication ability. Two scores were obtained: LCQ Difference score (pre-intervention minus post-intervention) and LCQ Self-Report Change score (more/less/no change from pre-intervention assessment). Social validation interview data were also collected in addition to a range of additional measures of communication, social skills, carer burden and self-esteem. *Results:* Both training groups showed significantly greater LCQ Self-report Change scores when compared with the CONTROL group. Additionally, highly significant Difference scores were also obtained in the JOINT group (ECP, $p = .009$; person with TBI, $p = .02$). *Discussion:* Although preliminary, the LCQ change scores provide encouraging evidence of positive change in communication skills. Both treatments produced better outcomes than no treatment. On the Difference score, however, communication partner training demonstrated greater, positive change than training the person with TBI by themselves.

Social Interaction Group: A Supported Participation Approach to Enhancing Social Competence

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Background: This group program was developed through collaboration between Westmead Community Rehabilitation Team (CRT) social worker and speech pathologist, and targeted community clients with social communication difficulties. Literature indicates that social interaction difficulties can negatively impact on client's relationships with friends and

family, leading to long-term outcomes such as loneliness and social isolation (Sloan, 2004; Ylvisaker, 2005). A supported participation approach was chosen to enable clients to build skills in everyday interactions within a natural setting. *Program Aim:* To improve clients' competence when interacting socially and assist them in maintaining or developing satisfying relationships with friends and family, thereby reducing barriers to successful community integration. *Program Plan:* The program provided opportunities for clients to engage in positive interactions with their peers within a natural yet supportive group environment within the local community. Techniques used included person-centred goal formulation and coaching (modeling, provision of prompts, application of communication strategies). The program included individual pre group goal setting interviews, five fortnightly group sessions, and post group interviews with clients and family/friends. *Outcomes:* The group was evaluated using Sydney Psychosocial Reintegration Scale (SPRS), social atom (Sloan et al., 2006), client feedback questionnaire and interviews with friends and family members. The results indicated that each client made tangible improvements in communication patterns and relationships, and also reported improved confidence in social interactions. *Conclusions and Implications:* This approach was essentially successful in achieving improvements in social competence and in maintaining and developing relationships. Our application of this approach is continuing to evolve as we develop the program further.

Parenting After Brain Injury: A Pilot Study

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Parenting is an important life role for most people and can present complex challenges at both personal and environmental levels for people with acquired brain injury who may also have a range of cognitive, physical, behavioural and communication impairments. Currently, generalist parenting supports available in the community are typically presented in group format, and often do not meet the needs of people with acquired brain injury. This project developed a model of individualised and flexible parenting support which can be used within the context of a community rehabilitation service. The project used participatory action approaches involving parents, their partners and rehabilitation coordinators in the development and implementation of a 6-week psycho-educational parenting program which was tailored in format and content to meet individual needs. This paper will present preliminary data analysis from a pilot program involving three family units, and discuss the specific benefits and challenges for parents with acquired brain injury. Initial results from qualitative analysis using NVivo indicates that parents with ABI and their partners have experienced improvements in their child/children's behaviour since commencing the program. Parents also reported improved self-efficacy and confidence in their roles as parents. This intervention appears to offer a promising approach to facilitating parenting support within the community rehabilitation context, and may provide ongoing benefits for parents with acquired brain injury and their family units.

Successful Return to Parenting: A Complex Path

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The role of a parent is known to be both challenging and rewarding. After a parent suffers a severe traumatic brain injury (TBI) this poses a question of how best to enable the person to successfully return to participating in their parent role. This complex, nonlinear process is potentially problematic. The process is influenced by the person's resulting impairments, the person's adjustment to these changes, and the family's reaction and adjustment to these changes. The parent–child and parental pre-injury relationships are significant factors to this process. Amidst these problems are the desires of the parent and child. This issue was address by evolving a model within a rehabilitation program using a multifaceted approach. A retrospective review was then completed to investigate the key components of the approach implemented to enable eight severely injured parents to successfully return to being a parent. Each of the parents had school-age child (children), each had family relationships problems at the times of intervention, with six of the parents not having access to their child (children) pre intervention. Post intervention the parents had returned to having an active role as a parent, all were seeing their child (children) and all were able to maintain this role after the therapeutic intervention. Essential components of this approach included gradual skill development, communication skills, relationship issues, and involvement of feedback from all parties involved, including the child (children). The paper aims to highlight the successful approach to enable parents with TBI to regain their participation as a parent despite the multiple problems posed in this pathway.

The Association of Age With Long-Term Psychosocial Outcome Following TBI

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Objective: To examine the association of age with long-term psychosocial outcome following traumatic brain injury (TBI). *Methods:* Participants were 112 participants with mild to very severe TBI, aged 26–89 years at 5–22 years post-injury, 112 significant others (SO) and 112 healthy controls matched for current age, gender, education and estimated IQ. Changes in occupational activity, interpersonal relationships and independent living skills were assessed in TBI participants using the Sydney Psychosocial Reintegration Scale (SPRS). Employment status of TBI and control participants was compared at the time of assessment. *Results:* No age effects were demonstrated on the three SPRS domains. However, compared with healthy individuals, older TBI participants showed greater likelihood of unemployment relative to younger TBI participants. *Conclusions:* By using matched controls this study has clearly demonstrated that older individuals with TBI are less likely to return to the workforce than younger TBI individuals. Other aspects of psychosocial outcome appeared to be less affected by age, although specific domains require closer examination in relation to healthy age-matched controls.

Preliminary Arabic Normative Data of Neuropsychological Tests: The Verbal and Design Fluency

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Introduction: There is paucity in normative data of neuropsychological measures for Arabic speaking population. *Objectives:* The objective of the present study was to provide preliminary norms for three fluency tests in Arabic language: The verbal fluency (phonemic and semantic) and design fluency tests. *Methods:* Three Arabic letters have been chosen for the phonemic fluency task, in accordance with the letter selection procedure described in the development of the standard test. Animal fluency was chosen for the semantic fluency, and the 5-point test for the design fluency test. *Participants:* An Arabic speaking sample of 215 healthy subjects (115 male, 90 female), with age ranging from 18–59 years, and with different educational levels, were selected for this study. *Results:* The results showed the age and education have significantly influenced performance in verbal phonemic and semantic tasks, but not the design fluency test. No gender effect was found in any of the three tasks. However, the effects of age and education did not take the same trend. While education effects were linear, age effects appeared to be curvilinear. *Discussion:* This pattern is congruent with that reported in the western literature. The implications of these results in relation to the development of Arabic norms were discussed. It was concluded that these tests could be used in Arabic-speaking population with due considerations to the effects of age and education.

CONCURRENT SESSION 14: Community Resettlement

Does Case Management Increase Participation and Function After Traumatic Brain Injury? A Systematic Review

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Introduction: Adults who survive a traumatic brain injury (TBI) require ongoing rehabilitation. They commonly see a range of health and medical specialists; case management is use to co-ordinate these services and to assist client with negotiating a number of different health systems. Despite its common use throughout Australia, little is known about the effectiveness of a case management program. The purpose of this study was to evaluate the evidence for effectiveness of case management during recovery from TBI in adults. *Methods:* Systematic review methodology. Electronic databases were searched and 5 articles met the criteria for review. Each paper was critically appraised and summarised. PEDro scale was used to determine the quality of randomised controlled trials (RCT) and the QUORUM scale was used to determine the quality of systematic reviews (SR). *Results:* Four RCT's and one SR were appraised and their design features and data relating to participation and function outcomes were placed in two evidence tables. Due to methodological limitations, there was neither clear evidence of effectiveness nor of ineffectiveness. *Discussion:* Among the principal findings are: (1) there is a paucity of applicable research on case management, (2) there is a

major need to evaluate the impact of case management on participation outcomes, and (3) there remains considerable variation between case management services provided in clinical research and that which is provided in the Australian community. This paper will provide suggested ways forward for both clinicians and researchers.

Linking Cognitive Capacities to Occupational Performance Areas

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Background: Occupational therapy traditionally dichotomises traumatic brain injury (TBI) rehabilitation into impairment focused or functional performance focused approaches. The Occupational Performance Model Australia (OPM-A) identifies these levels of occupation as component capacities and performance areas. This study evaluated an intervention approach that attempts to directly facilitate the link between component capacities and performance areas within the OPM-A. *Participants:* Eight adults with TBI were recruited during acute rehabilitation. Participants had not emerged from post-traumatic amnesia (PTA) and were demonstrating agitation. *Design:* Correlational study evaluating the relationship between occupational performance and underlying component capacities. Participants were evaluated daily for 4 weeks, under alternating conditions of current occupational therapy (Weeks 1 and 3) and the experimental intervention: cognitive strategy training based on the Perceive, Recall, Plan and Perform (PRPP) System (Weeks 2 & 4). *Instrumentation:* The PRPP System is a dual assessment and intervention approach. A *functional* task analysis provides Stage 1 information on error-free task performance. Stage 2 uses a *cognitive* task analysis to evaluate use of cognitive strategies during task performance. The correlation between Stage 1 and 2 of the PRPP System indexed the degree to which occupational therapy linked the OPM-A levels of component capacities and performance areas. *Results:* The relationship between PRPP Stage 1 & 2 scores was stronger during PRPP intervention weeks ($r = .73 - .83$, $p \leq .001$), than during current therapy weeks ($r = .59 - .68$, $p \leq .001$). In particular, the relationship between participants scores in the Plan quadrant of PRPP Stage 2 were strongly correlated with Stage 1 scores during Weeks 2 and 4: $r = .71 - .83$, $p \leq .001$. *Conclusions:* Cognitive strategy training based on the PRPP System better facilitated the link between underlying component capacitates and occupational performance in adults who were in PTA and demonstrating agitation. Specifically, plan quadrant strategies demonstrated the strongest association with occupational performance.

Interagency Collaboration Working With Violent Adolescents With an Acquired Brain Injury

Harriet Ferguson

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This presentation uses two case studies to examine best practice intervention when working with clients within a multi-service paradigm. The two case studies have the following characteristics: both young people sustained a brain injury more than 5 years ago, both have self-regulation and cognitive difficulties due to the injury, both young people live with domestic violence, and both are currently involved with the justice system in relation to familial violence. Due to the high number of agencies that became involved with these young people, interagency collaboration became essential for effective service delivery. The challenges to effective collaboration will be explored. The acquired brain injury (ABI), which was a dominant issue for both of these young people, was ignored in service provision by other agencies. It became essential to develop a service delivery model that advocated for these clients by giving voice to ABI when dealing with these non-ABI specific agencies. Key features of the service delivery model include educating other agencies about brain injury issues, instigating interagency collaboration, and advocating for brain injury issues to shape the interventions provided by other agencies.

Re-Engagement in Meaningful Occupations During the Transition From Hospital to Home for Individuals With Acquired Brain Injury and Their Family Caregivers

Ben Turner,[1] Tamara Ownsworth,[2] Petrea Cornwell[1] and Jennifer Fleming[1]

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Introduction: The transition from hospital to home has been identified as a critical phase of the rehabilitation continuum following acquired brain injury (ABI) as it marks the commencement of the community re-integration process. Given this, it is important to examine individuals lived experiences of the transition phase in order to better inform clinical practice and models of service delivery. *Objective:* To explore the lived experiences of re-engagement in meaningful occupations during the hospital-to-home transition phase following ABI. *Method:* Participants included 20 individuals with ABI and 18 family caregivers. Based on a phenomenological approach, data collection entailed in-depth semi-structured interviews, which were conducted at the following time points: pre-discharge and 1- and 3-months post-discharge. Thematic analysis of the interview transcripts involved open, axial and selective coding techniques. *Results:* Two primary themes emerged from the analysis, namely, 'desired versus actual participation' and 'the struggle for independence'. Theme one depicts the key occupations of importance to individuals and their caregivers during transition and explores the issue of desired and actual participation in occupations. Theme two highlights the struggle experienced in regaining independence and the differing perspectives of the two participant groups concerning this process. *Discussion/Conclusions:* The clinical practice implications relate to client-centred goal setting, contexts/environments in which therapy occurs, and the provision of information to individuals and families.

Understanding the Changing Community Care Needs of People With Acquired Brain Injury: New Horizons in Conceptualising Community Care

Melissa Kendall, Ray Quinn and Jessica Staskiewicz

Acquired Brain Injury Outreach Service, Queensland Health, Australia

Introduction: People with Acquired Brain Injury (ABI) experience a range of community care needs that are poorly understood within existing health, rehabilitation and welfare arenas. *Objectives:* (1) Explore how care needs change over time and (2) Explore how these needs are met from the perspective of people with ABI and their significant others. *Method:* Using a longitudinal case series design, 58 participants with ABI and 48 significant others completed questionnaires assessing the need for and provision of practical, emotional, informational and memory support at baseline, 3 months and 6 months. In parallel, in-depth interviews were conducted to clarify and expand the quantitative findings. *Results:* Quantitative findings identified the changing nature of care need and provision, especially in the domains of informational and memory support. Findings indicated that people with ABI often did not perceive a need for additional care as their support needs were being met by the family. Qualitative findings suggested that this situation was often acceptable and preferred by both the person with ABI and the family. While both people with ABI and family members did not identify a need for paid care to enter their homes, they did perceive a need for service support in times of crisis, particularly in relation to emotional support. *Discussion/Conclusions:* Community care needs are dynamic and reactive to personal and environmental stressors. Traditional models of care provision appear inappropriate for the ABI population, highlighting the need to develop and fund models of care that are responsive to consumer-identified need over the lifespan.

Young People With Disability in Residential Aged Care: Outcomes of the Current National Initiative

Dianne Winkler,[1,2] Louise Farnsworth,[2] Sue Sloan[3] and Ted Brown[2]

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Throughout Australia there are approximately 1000 people under 50 years of age residing in aged care facilities. The most common disability type for this group is acquired brain injury (61%). In February 2006, the Prime Minister announced a $244 million Council of Australian Governments (COAG) initiative, which will develop alternatives to young people living in aged care. This initiative is one of the largest to be undertaken internationally. The 5-year COAG initiative is in its third year. The aims of this paper are twofold. The first aim is to evaluate the progress of this initiative by providing an overview of progress across the nation. The second aim is to present the preliminary results of a follow-up prospective longitudinal study of 50 young people in aged care. The study, which employs repeated measures, examines the health and wellbeing of young people in aged care in Victoria who have participated in the COAG initiative. The roll-out and progress of the COAG initiative is markedly different in each state. These differences relate largely to the extent to which services for this target group were already established prior to the initiative and the degree to which the state government has engaged the sector in the implementation. In the second part of the paper we will present the health and wellbeing baseline data for participants in the follow-up study. As well, preliminary outcome data for participants who, in the first 3 years of the initiative in Victoria, have either moved out of aged care or been diverted from aged care placement will be described.

Innovative Models and Design in Housing and Support for People With Severe Acquired Brain Injury

Kerry Stringer[1] and Di Winkler[1,2]

[1] *Summer Foundation Ltd, Australia*
[2] *Monash University, Australia*

The $244 million 5-year COAG initiative provides a tremendous opportunity to develop some innovative and pragmatic solutions to the issue of young people in aged care in Australia. The most common disability type of young people in aged care is brain injury (61%). The scale of development for housing for people with disabilities and high care needs is unique internationally. The aims of this paper are two fold. The first aim is to describe a housing development framework that will develop a range of housing options for this target group. The second aim of this paper is to present the findings of a project that aims to foster innovative design in accessible and affordable housing for this target group. The housing development framework involves collaboration with people with disabilities, government, housing associations and community service organisations to develop a range of integrated affordable housing for up to 100 people in aged care, at risk of admission to aged care or living with ageing parents in the community. The innovative design project examines state of the art design in relevant or comparable projects where the architectural organisation and image are driven by the concept of ‘home’. This paper will describe design elements that support people’s wellbeing and autonomy within their home, outdoors and in their local community. We will also outline future research such as post occupancy evaluations, which will further develop expertise in the design of the physical environment for this target group.

The Effect of Traumatic Brain Injury on Drivers’ Hazard Perception

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Individuals recovering from traumatic brain injury (TBI) often experience perceptual, cognitive, and motor deficits that adversely affect their driving. However, many individuals with TBI return to driving, despite evidence that they are at increased risk. This study examined the effects of TBI on drivers’ hazard perception, that is, the ability to search the road ahead and quickly identify potentially dangerous traffic situations. Slower hazard perception has been associated with higher crash rates (e.g., Quimby et al., 1986), but hazard perception has never been assessed after TBI. A convenience sample of adults recovering from mild, moderate and severe TBI was recruited from the rehabilitation unit of a tertiary level hospital. Uninjured controls were recruited from the community. Participants completed a hazard perception test, in which they viewed videos of genuine traffic scenes filmed from the driver’s perspective and indicated as soon as they detected a potential traffic hazard (mean response latency was the main dependent measure). Participants also completed a simple spatial reaction time task, a digit symbol substitution task and several measures related to pre- and post-injury functioning. Preliminary results indicate that individuals with TBI were significantly slower to detect traffic hazards than controls. The findings may signify the need for hazard perception testing or training post-TBI before return to driving.

CONCURRENT SESSION 15: Paeds 3

Higher Language Functioning in Children Following Traumatic Brain Injury

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and Jeff Rosenfeld[2]

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Introduction: Children with TBI often present with communicative and social difficulties that are often overlooked or misdiagnosed. The Test of Language Competence (TLC-E) presents as a useful clinical tool in identifying and measuring high level language difficulties in adults. However, no studies have investigated its usefulness in the paediatric population. This study is the first to report data on the utility of the TLC-E in children. *Methods:* This study is part of a larger dataset of 96 children who sustained a TBI. The TLC-E assessing metalinguistic competence in semantics, syntax, and pragmatics, was administered to all children at the 10-year follow-up assessment. Between-group (mild, moderate, and severe) performances were analysed to determine the impact of injury severity on high level language difficulties. *Results:* Injury severity was negatively associated with TLC-E subtest scores. Children in the severe TBI group had the greatest impairments in all four subtests (ambiguous sentences, listening comprehension, oral expression, and figurative language). Controlling for injury severity, age at injury was negatively associated with greater degree of impairments. *Discussion:* Children with more severe TBI demonstrated greater high level language deficits. Younger children sustaining a TBI had greater deficits. Findings suggest that the TLC-E is a useful tool in the paediatric population and should be incorporated as part of a paediatric TBI assessment protocol to aid treatment planning.

Long-Term Linguistic and Literacy Outcomes in Children After an Early Traumatic Brain Injury (TBI)

Matthew H.J. Frith

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Children who sustain a traumatic brain injury (TBI) early in life (i.e. less than 3 years of age) are often monitored for changes in cognitive, communication and behavioural function. This is highlighted due to the scholastic challenges children may face when they commence school (Catroppa & Anderson, 2004). There are limited publications on the recovery pattern of children after an early TBI particularly in reference to linguistic capabilities post injury. Research suggests poor prognosis in later developing cognitive and linguistic competencies, (Barlow, Thomson, & Minns, 2005), where a case study report indicates good initial recovery (Trudeau, Poulin-Dubois & Joanette, 2000). This paper will present 2 case studies demonstrating similar recovery patterns in linguistic capabilities, indicating good improvement initially due to early intervention. However, the trajectory in recovery slows particularly in areas of literacy and linguistic competencies 1 and 2 years into schooling despite initial significant improvements in their recovery. The presentation will propose suggestions for intervention planning that may be incorporated into individual practices to enhance better linguistic, literacy and educational outcomes for this population.

Written Persuasive Discourse Abilities of Adolescents With Traumatic Brain Injury (TBI)

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The power to persuade in written form develops in childhood and progresses well into adulthood combining an array of cognitive, linguistic and social abilities. Given the complexity of persuasive discourse, combined with the potential cognitive and communicative problems suffered by individuals with TBI, the question of how individuals with TBI perform on persuasive discourse tasks is relevant to understanding and improving communication skills for this population. This study evaluated the written persuasive discourse abilities of adolescents with TBI compared with age matched peers without a TBI on an essay task based on the topic of whether trained animals in circuses should be allowed to perform for the public. Measures included: language productivity (number of words, number of T-units and mean length of T-unit) language complexity (number of clauses, clause density and clause breakdown) and pragmatics (claim, number of reasons, number of elaborations, conclusion, irrelevancies, repetition of information and attitude). In comparison to their age-matched peers, the TBI group produced significantly fewer reasons to support their claims, significantly more repetitions of information and failed to take alternative perspectives on the topic. There were no significant differences on any measures of language productivity or complexity; however, the TBI group performed consistently below their peers on these measures. The results are discussed in relation to language and pragmatic outcomes, cognitive impacts on performance, clinical implications and suggestions for practice.

Which Method of Posttraumatic Stress Disorder Classification Most Accurately Predicts Psychosocial Outcomes in Children with Traumatic Brain Injury?

Greg Isellin,[1] Justin Kenardy,[1] Vicki Anderson,[2] Lynne McKinlay[3] and Robyne Le Brocque[1]

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Controversy surrounds the classification of posttraumatic stress disorder (PTSD). This is rendered more difficult in child and adolescent populations by the presence of head injuries and alterations in consciousness. Several methods of classification have been proposed, yet research into their diagnostic and clinical utility is lacking. This paper will investigate the validity of commonly-used PTSD classification systems in children with traumatic brain injury (TBI), with reference to psychosocial function. 204 children aged 6 to 14 years were recruited following admission at emergency departments in Brisbane and Melbourne for TBI. Participants were assessed at several time points post injury. Posttraumatic stress symptoms were identified via structured interview (CAPS-CA). Health outcomes were assessed via the Child Health Questionnaire (CHQ). Predictive models that take into account injury severity are compared and recommendations are made regarding the relative merit of the range of diagnostic classification methods.

Does Posttraumatic Stress Predict Health Outcomes in Children With Traumatic Brain Injury?

Justin Kenardy,[1] Vicki Anderson,[2] Robyne Le Brocque[1] and Lynne McKinlay[3]

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Research on Iraq War veterans who have experienced mild traumatic brain injuries (mTBI) has found that posttraumatic stress mediated the effects of the mTBI on health outcomes. The aim of this paper is to explore the predictive value of posttraumatic stress on health outcomes in children with mild, moderate and severe traumatic brain injury (TBI). 204 children aged 6 to 14 years were recruited following admission at emergency departments for TBI. Participants were assessed at several time points post injury. Posttraumatic Stress Disorder (PTSD) was identified via structured interview (CAPS-CA) at 3-months post injury. Health outcomes were assessed using the Child Health Questionnaire (CHQ). Preliminary analyses indicate that the presence of PTSD was unrelated to the severity of the TBI, especially when overlapping symptoms were taken into account. However PTSD at 3-months does significantly predict Health Outcomes on CHQ at 12-months post-injury. Furthermore PTSD is associated with extended recovery time as identified by patterns of outcome trajectories. In conclusion identification of PTSD in children following TBI will assist clinicians to target services and assist rehabilitation and recovery.

Prevalence and Features of Dysarthria and Dysphagia in Children With Posttraumatic Brain Injury

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Introduction: A lack of data on dysarthria and dysphagia outcomes for children following traumatic brain injury (TBI) limits our clinical understanding of these children, and poses daily challenges for the speech–language pathologist (SLP) managing this group. The present study aimed to examine dysarthria and dysphagia incidence and the clinical presentation of children with these disorders in the acute phase following brain injury. *Methods:* Point prevalence and characteristics were determined via a comprehensive retrospective medical chart review of children consecutively referred a tertiary paediatric hospital over an eight year period. Cases ($n = 22$ dysarthria, $n = 72$ dysphagia) and matched controls with TBI were compared across ancillary variables (e.g., age, severity of TBI, motor impairment). *Results:* Prevalence across the entire cohort was low (i.e., dysarthria, 1.2%, 22/1895), dysphagia (3.8%, 72/1895), but was unsurprisingly higher for children with severe TBI (e.g., dysphagia, 76%, 63/83). Speech deficits were reported across respiration, phonation, resonance, articulation and prosody. Swallowing deficits included reduced lip closure, delayed swallow initiation, wet voice and coughing. Language and swallowing deficits were often comorbid with dysarthria. Cases had longer periods of hospitalisation, ventilation and supplementary feeding compared to controls. *Discussion:* Despite the low preva-

lence of dysarthria and dysphagia across the entire TBI cohort, this subgroup may place longer-term burden on SLP services, having prolonged periods of ventilation, extended periods of hospitalisation and a complex comorbid clinical presentation compared to controls. The prevalence of comorbid communication and swallowing impairments suggests a need for integrated rather than single discipline (i.e., dysphagia stream only) SLP services.

Does Insight Into Long-Term Psychosocial Outcome Post Paediatric TBI Differ Between the Injured Person and Parent?

Sandra Brown,[1,2] Senem Eren,[1,2] Heidi Newitt,[3] Vicki Anderson,[1,2,4] Cathy Catroppa[1] and Frank Muscara[1]

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Introduction: Clearly defined long-term outcome from paediatric traumatic brain injury (TBI) is difficult to predict, affecting immediate and ongoing treatment and management. This study examined the retrospective consideration of psychosocial outcome from perspective of the parent and adult child. *Methods*: Inclusion was via inspection of information regarding medical status at admission to the Royal Children's Hospital, Melbourne, Victoria. Participants were 84 young adult survivors of child TBI (54 males), aged 18-31 years at testing ($M = 22.7$, SD = 2.9), with injury on average 14 years prior to evaluation. They were grouped according to injury severity: mild ($n = 32$), moderate ($n = 24$) and severe ($n = 28$). The Sydney Psychosocial Reintegration Scale (SPRS) was used to measure outcome, as was an open-ended question regarding perceptions of outcome from both the adult child and parent's viewpoint. *Results*: Preliminary analysis of the quantitative data suggests that parents and adult survivors perceive long-term outcome similarly regardless of severity of injury or time since injury. However qualitative data suggests underlying differences may exist. *Discussion*: These findings indicate that parents of adults injured as children commonly remain aware of the ongoing effects of TBI, as does the injured person. However further investigation utilising less structured approaches may reveal underlying differences.

CONCURRENT SESSION 16: Addiction

The Neural Mechanisms of Drug Addiction

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The aim of this paper is to examine the mechanisms related to long-term compulsive patterns of drug-seeking behaviour or addiction by the chronic use of exogenous opioids. Studies suggest that differences exist between individuals in neural substrates that regulate addictive behaviours and that addiction may be facilitated by inherent predisposition as well as the pattern of drug use and environmental factors. Notwithstanding, addiction is commonly associated with sensitisation that is thought to involve long-term changes in opioid receptors and intracellular molecular structures caused by the use of a drug. Sensitisation represents an increase in the effect of a drug

following repeated administration, which is the hallmark of addiction as some forms of sensitisation persist for long periods of time after discontinuation of drug exposure. Moreover, recent research has shown that chronic drug use activates neural circuits associated with motivation and reward and, cause changes in long-term plasticity associated with memory and learning. In short, the evidence from neuroscience research indicates that drug use is the primary cause of drug addiction. Moreover, chronic exposure to morphine and other drugs of addiction may impair the learning of or motivation for reward, thus impeding the natural regulation of hedonic tone. This dysregulation of specific neurochemical mechanisms associated with reward and stress circuits of the brain implies some long-term shift in the ability to regulate mood. Understanding of these mechanisms is important in the formulation of treatment paradigms that do not compromise the safety or wellbeing of the addict.

SMACK! Does Your Brain Get Away Unscathed From Heroin? A Review of the Neuropsychological Sequelae of Opiate Use

Michelle Morandin, Julia Herrmann & Luke Delaney

ARBIAS – Alcohol Related Brain Injury Australian Services, Brunswick VIC, Australia

More than 36,000 Australians used heroin (smack) over the past 12 months, while 300,000 had used the drug during their lifetime. Heroin users continue to place a heavy demand on Alcohol and Other Drug (AOD) treatment agencies and on the health system, with many remaining on opiate replacement therapies (e.g. methadone) for years. The prevailing view among both users and the AOD community seems to be that, provided you don't overdose, heroin does not cause any harm to the brain. Inherent difficulties in studying this population, particularly given the high incidence of poly-substance use, have to date prevented the development of a robust scientific literature on the effects of heroin and other opiates. There is now a growing body of evidence that heroin may not be so benign in terms of its effects on the brain. Changes in frontal and temporal lobe grey matter regions have been identified in opiate-dependent individuals. This paper will review evidence of both acute and long-term effects of heroin on neuropsychological functioning. Potential changes in attention, processing speed, memory recall, visuospatial skills and aspects of higher order executive abilities will be examined. Practical implications regarding possible impacts of heroin use on everyday cognitive functioning and behaviour will be discussed.

SMACK, Methadone, Obsessive Compulsive Disorder and the Law: A Case Study

Luke Delaney, Julia Herrmann and Michelle Morandin

ARBIAS – Alcohol Related Brain Injury Australian Services, Brunswick, Melbourne, Australia

'Lyn' is a 25-year-old woman who was facing shoplifting charges in the Victorian Magistrate's Court in 2008. She was referred for a neuropsychological assessment given concerns she may have an acquired brain injury. Lyn had a history of heroin use and was on the methadone program. The neuropsychological assessment identified a pattern of weaknesses in attention, information processing speed, memory recall and planning. The assessment identified a relationship between Lyn's offending behaviour and an apparent undiagnosed obsessive compulsive disorder (OCD). Lyn had an obsession with cleanliness. In short, this meant that she relied heavily on the availability of brand new clothes (i.e., unworn) for both herself and her young son. Unable to afford to new clothes on a daily basis, she resorted to theft. This paper will present the case of Lyn in terms of her neuropsychological functioning and with reference to the literature on the relationship between heroin use, methadone therapy and OCD. The paper will conclude by describing the positive impact the neuropsychological assessment had upon Lyn's management within the justice system.

Head Injury and Addiction Among NSW Prison Inmates

Devon Indig

Centre for Health Research in Criminal Justice, Justice Health, New South Wales, Australia

Introduction: To describe the association of a history of head injury and drug and alcohol addiction among a population of NSW prison inmates. *Methods:* Analysis of the preliminary results 2008 Inmate Health Survey which includes a random sample of $N = 759$ inmates stratified by age, gender and Aboriginality. Odds ratios were calculated to assess the relationship of head injury to a number of drug and alcohol self-report variables. Analyses were conducted for the total population, as well as split by sex and Aboriginality. *Results:* Nearly half (49%) of prisoners had ever had a head injury resulting in unconsciousness, with a median of 2 and an average of 6 head injuries per person. The majority (85%) of prisoners had tried illicit drugs, over half (58%) had ever injected drugs and 26% reported a history of alcohol dependence. Prisoners with a history of head injury were significantly more likely to have a history of alcohol dependence (OR = 2.6), report regular ecstasy use in the past year (OR = 2.9) and to have a history of injecting drugs (OR = 1.6). These findings were only significant in men and people of non-Aboriginal origin. *Discussion:* There are a number of significant associations of drug and alcohol addiction with having a history of a head injury. It is not possible in this cross-sectional survey to determine whether the head injury or drug and alcohol abuse occurred first or to assess any causal relationship. A better understanding of these associations may assist with developing appropriate treatment interventions.

POSTER PRESENTATIONS

Can Teenagers With Traumatic Brain Injury Use Internet Chatrooms?

Andrea Kilov, Leanne Togher and Emma Power

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Background: Two surveys have recently been published which describe strong interest amongst people with traumatic brain injury (TBI) in the Internet to maintain contact with relatives and friends, and to combat social isolation and boredom (Todis, et al., 2005; Vaccaro et al., 2007.). Further descriptive are needed to develop an understanding about how people with TBI use Internet chatrooms, and whether they can be used to develop communicative and social competence. *Aims:* (1) describe how teenagers with TBI communicate with unfamiliar teenagers in internet chatrooms and (2) identify challenges and advantages of chatrooms for teenagers with TBI. *Method:* 10 teenagers with TBI and 10 of their family/ friends matched for age, sex, level of education will be recruited through TBI centres in Australia

and America. All participants will be asked to use a pseudonym and protect their anonymity before entering the chatroom. They will be asked to engage in a ‘getting to know you task’ in a chatroom with 2 unknown communication partners matched for age, sex, and level of education from a different country for at least 30 minutes on 3 occasions. A moderator will be present and intervene should participants discuss topics considered to be offensive, or if they divulge personal information. Transcripts will be analysed using exchange structure analysis (Halliday, 1994.), topic analysis (Mentis & Prutting, 1991.), and content analysis. Participants will also be asked complete a modified computer user profile based on work by Todis et al., 2005. *Progress:* Ethics submission pending.

Issues of Loss to Follow Up in Population-Based Study of Traumatic Brain Injury

Jenny Langley,[1,2] Sama Johnson,[1,3] Mark Slatyer,[1,2,3] Clive Skilbeck[1,3]
and Matthew Thomas[1,3]

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Background: The Tasmanian Neurotrauma Register began prospective data collection in November 2003 as part of a population based study of traumatic brain injury (TBI) to track the natural history of TBI in a previously unobserved population. It has been funded by the Motor Accident Insurance Board of Tasmania. *Objective:* To examine the loss to follow up of individuals a population based study of TBI across all levels of severity over multiple time points. *Method:* A sample of 947 patients seen within the Department of Emergency Medicine and inpatient services at the Royal Hobart Hospital from November 2003 to November 2006 and followed up prospectively over multiple time points — 1 month, 3 months, 6 months, 12 months, 2 years and 3 years. Interviews were conducted to cover information over cognitive, physical and psychosocial domains. Loss to follow up was calculated for the study population in total and then broken down for each level of severity (as defined by length of posttraumatic amnesia). Factors such as mechanism of injury, socioeconomic levels and gender were examined to look for predictive factors in attrition rates. Analysis for premorbid factors of drug and alcohol use, psychological and psychiatric disorders and previous head injury are still being determined. *Results:* Participants with mild traumatic brain injury (MTBI) had a greater risk of being lost from the research. People with severe injuries were retained in the study longer. The high risk period was revealed to be between the 6 and 12 months with considerable loss after this time point. Preliminary Chi squared analysis supports this observation and identifies assault victims sustaining MTBI, and males to be more likely to be lost to follow up from the study. *Discussion:* TBI observed in a population based study has been observed to be a difficult population to track. Once categorised by levels of severity, MTBI can be seen to behave differently to moderate and severe TBI, placing them at high risk of being lost to follow up in longitudinal studies. Further examination of this issue is warranted to determine reasons of loss; for example, improvement in symptoms leading to lack of interest in study; participant fatigue due to methodological issues or social issues. Further work is also justified to correlate the loss to follow up in research programs with the loss experienced from clinical services within the total TBI population.

To Enable Participation We Must Start With Enabling Choice

Kerry Stringer, Di Winkler and Helen Harrington

Summer Foundation Ltd, Australia

Research highlights both the injured person and family members frequently report they are socially isolated and their needs are unmet. Alarmingly recent research (Winkler et al., 2007) identified these problems are significantly higher for the most severely injured persons and their family. Families with a member under 50 living in an aged-care facility consistently reported they felt isolated and had limited access to information. The majority of families reported not knowing what help or assistance was available, or how to gain this information. In turn this lead the family members to feeling socially isolated, increased their distress and disabled their ability to make a choice. In response to these findings the Summer Foundation commenced a pilot program to implement a creative response to enable the access of information and support for this disempowered group. A collaborative approach was taken with the injured person, family members, service providers and funding bodies. Interestingly, the initial consultation phase highlighted that the response was more complex than just developing an information package. The evolved model involves multiple approaches, including the development of peer support, developing a model of family networks and pathways to enable families to support each other at times of choice, and allowing multiple methods of gaining information to suit the family's needs and changes. The model allows for empowerment for family and their family members to be informed, to feel supported and to enable choice. The paper aims to describe the multifaceted approach to enable choice to the most severely brain injured persons and their families.

The Predictors of Aggressive Behaviour in Hospitalised Patients with Brain Injury

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[2] *School of Psychology and Griffith Institute for Health and Medical Research, Griffith University, Australia*

Aim: This project investigated factors related to aggressive behaviours shown by brain-injured inpatients of a Brisbane metropolitan tertiary hospital over a 16-month period. The aim was to identify factors which predict aggressive behaviour in these patients. *Method:* Nursing and ward staff in the Neurosciences and Brain Injury Rehabilitation wards identified patients who had been aggressive during their hospitalisation. A comprehensive medical chart review of 32 patients who exhibited aggressive behaviours was completed, and potentially relevant variables (e.g., mental illness, substance use, education) recorded, to compare against a group of 32 patients who did not. *Results:* Education level, past history of aggressive behaviour, degree of independence for activities of daily living, absence of co-morbid medical conditions, and length of hospital admission correlated significantly with aggressive behaviour. Using these variables, standard logistic regression successfully predicted 87.5% of the nonaggressive group, and 78.1% of the aggressive group, with an overall prediction success rate of 82.8%. The model explained 61.4% of variance. Of the five variables, four were found to significantly contribute to the predictive ability of the model. These were an education of 10 years or less compared to 13 years or more, a history of aggression, dependence on staff for assistance with activities of daily living, and a hospitalisation of 51 days or more. *Discussion:* The results can be used to assist in the early identification of brain injury patients who have the potential to display aggressive behaviours, and where the early application of behaviour management strategies may be of benefit.

Functional Abilities of Children With ABI Following Inpatient Rehabilitation

Jane Galvin,[1,2] Jeremy Lim,[2] Kari Steer[1] and Jane Edwards[1]

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Several studies from the United States have reported trends in functional changes during inpatient rehabilitation for children admitted with acquired brain injury (ABI). However, data from an Australian population is not available for comparison of outcomes with international centres. *Methods:* The Victorian Paediatric Rehabilitation Service commenced provision of services in 2005 and since June 2006 the Pediatric Evaluation of Disability Inventory (PEDI) has been used as a sensitive and reliable measure of functional change. The PEDI has been administered to all children admitted to VPRS within three days of admission and within three days prior to discharge. Admission and discharge PEDI data collected to January 2009 was analysed to determine patterns of recovery. *Results:* Admission mobility function scores were significantly lower than self-care and social function scores for both functional skills and caregiver assistance scales. At discharge, the cohort made significant changes across all domains of both scales, and the greatest and least gains were made in mobility and social function, respectively. Overall functional status at admission was moderately negatively associated with changes in social function capability and independence at discharge. *Discussion:* Children with ABI made clinically significant gains in capability and independence in all domains of functioning examined by the PEDI, with the greatest gain made in mobility and the least in social function. Children with greater functional deficits on admission demonstrated lesser recovery of social function at discharge. Current findings suggest similar recovery trends during inpatient rehabilitation post-ABI in Australian children and those in the United States.

Components of Apathy Syndrome Following Traumatic Brain Injury (TBI)

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Apathy after ABI is an intriguing but infrequently researched condition. McAllister (2000) argues that it is one of the most clinically troublesome conditions. Available evidence indicates it negatively impacts rehabilitation and outcome. Marin (1990) defined apathy as diminution in behavioural, cognitive and emotional components of goal-directed activity, yet there is limited empirical support for 'components' of apathy. This study aimed to empirically investigate the components of apathy and a differential diagnosis. Thirty-five adults with severe TBI underwent neuropsychological and psychosocial assessment incorporating measures indicative of cognitive, behavioural and emotional components of apathy, plus emotional distress, fatigue and self-esteem. Two instruments assessed apathy, the Apathy Evaluation Scale (AES) and the Apathy subscale of the Frontal Systems Behavioural Scale (FrSBe-A). Initial results indicated the two instruments measuring apathy did not correlate ($r = 0.16$). While the AES tapped into the components of apathy, the FrSBe-A measured constructs more synonymous with emotional distress, lowered self-esteem, fatigue, problem solving and disinhibition. Subsequent analyses used the AES. Activity level was the most important behavioural factor for a diagnosis of apathy. Cognitive components of apathy were initiation and generativity. Emotional components incorporated insight, with lowered insight correlating with greater apathy. Differential diagnosis was indicated with emotional distress and fatigue, although not self-esteem. This study demonstrates the variability between measures of apathy, and the need for a consistent definition. Results provide empirical evidence for the components of apathy as behavioural, cognitive and emotional elements of goal-directed behaviour. Using this definition, differential diagnosis from emotional distress and fatigue is possible.

The Role of Communication in Maintaining and Forming Friendships in Adults Following Traumatic Brain Injury

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Communication difficulties and social isolation are significant and ongoing consequences of traumatic brain injury (TBI). However, there has been little convergence in the literature to date on these two areas. In particular the lived experience of maintaining and forming friendships following TBI has not been well reported. This qualitative study describes and analyses how two adults with TBI construct meaning about their communication and its impact upon their friendships. This information was sought with a view to understanding whether these adults perceived a link between their post-TBI communication and friendship changes; and in addition, which aspects of their communication were important in this scenario. Three major themes were evident upon analysis: *Evolution of Friendships Following TBI, Perceptions of Communication, and Opening up to Others*. Participants did not describe communication as being overtly linked to the evolution of their friendships. Communication was linked indirectly to their ability to maintain and form friendships via its influence on their ability to engage in activities with friends and peers. Participants wanted to open up to friends and peers about their post-TBI self. Unfortunately their communicative ability did not support this desire. Therefore, a second indirect link was identified between communication and its role in supporting friendships. A conceptualisation of themes is presented that represents a method of considering post-TBI communication difficulties and the implications for maintaining and forming friendships. Implications for professionals and future research are discussed.

Language-Switching and Language Selection in Bilinguals With Aphasia: Grammatical Versus Discourse Impairment

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Introduction: Code-switching refers to the bilingual's ability to switch languages within a conversation and within a sentence. This language-switching is both grammatically well formed and conforms to discourse/pragmatic constraints in proficient adult bilinguals who have acquired both languages in early childhood ('early' bilinguals). Bilinguals with aphasia due to stroke or other brain trauma may present with impaired language selection. Evidence of grammatical impairment of code-switching is less conclusive. The aim of this study was to investigate whether the code-switching of early bilingual adults with aphasia systematically differs from that of healthy bilingual adults on grammatical and discourse measures. *Methods:* A single case design was used to examine the code-switching of three early bilinguals with aphasia, in comparison to language- and age-matched controls. Code-switching was tested on three types of sentences (those with pronoun subjects, negation, wh-questions) across four conditions (conversation, narrative recount, elicited sentence production, lexical selection). Participants completed a detailed test battery assessing lexical, syntactic and cognitive abilities in each language. *Results:* The results for participants with aphasia differed significantly from the controls on grammatical but not discourse measures of code-switching. Significantly more language mismatches were produced on all sentence types for elicited sentences. Performance on lexical selection tasks varied across participants with aphasia. Language selection in conversation and narrative recount did not differ between participants with aphasia and controls. *Discussion:* These results provide evidence of a dissociation between discourse impairment and grammatical impairment of code-switching, and change over time in the capacity to code-switch. For these bilinguals with aphasia, grammatical impairment of code-switching was evidenced in the presence of unimpaired language selection. The implications for cognitive models of language switching will be discussed.

Improving Self-Awareness in People With Brain Injury Using Video-Feedback: A Single-Blinded Randomised Controlled Trial

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Introduction: Poor self-awareness is one of the biggest obstacles to successful rehabilitation of people with brain injury, affecting individuals' motivation and engagement in therapy. This research aims to investigate the effectiveness of a potentially powerful approach to improving self-awareness, namely the use of videotaped feedback of functional performance. It will also seek to determine the importance of frontal lobe functioning in self-awareness. Using a randomised controlled trial, the study will compare the use of videotaped feedback, verbal feedback and functional activity alone in 76 participants with traumatic brain injury. The focus of investigation is 'online awareness' that involves self-monitoring during functional tasks and error recognition. As well as determining the most effective method of treatment for self-awareness deficits, this study will also determine the most effect method of feedback to elicit improved task performance. *Design:* Randomised controlled trial with comparison between three treatment groups at three time-points (pre-intervention, post-intervention, and follow-up). Treatment groups are as follows:

- Treatment Group A: Video and verbal feedback
- Treatment Group B: Verbal feedback
- Control: Experiential feedback only

Progress/Plan: Ethical approval for this Randomised Controlled Trial will be submitted by 31 December 2009. It is estimated that recruitment will commence in March 2009. Preliminary case studies of each intervention type will be discussed at the time of ASSBI conference.

Exploring the Link Between Pragmatic Language Deficits and Self-Awareness

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Pragmatic language impairment can be a persistent and insidious deficit associated with traumatic brain injury (TBI) that limits an individual's capacity to partake in socially-skilled interactions. Concomitant cognitive impairments, including self-awareness, apparent post-TBI have been proposed to influence the presentation of, and treatment success for pragmatic language impairment. To-date, however, there has been limited investigation of the relationship between pragmatic language impairment and self-awareness deficits. The aim, therefore, of this preliminary study was to explore the link between pragmatic language impairment and self-awareness deficits in people with TBI. A single case series design with cross-sectional data was adopted. Five participants with TBI and five significant others completed the Self-Awareness of Deficits Interview (SADI) and the Social Communication Skills Questionnaire — Adapted (SCSQ-A), with level of pragmatic skill during a conversation evaluated using the Profile of Pragmatic Impairment in Communication (PPIC). Descriptive analyses were used to investigate patterns within individual cases. Results revealed that participants with TBI who had lower levels of self-awareness were more likely to demonstrate impaired pragmatic abilities, with discrepancies evident between the perceptions of significant others and individuals with TBI on self-report measures of pragmatic language abilities. Comparison across the five cases, however, suggested that the relationship between the pragmatic impairment and self-awareness deficits is not linear (i.e., greater deficit in self-awareness is not directly related to severe pragmatic impairment). Further research is required to elucidate the relationship between self-awareness and pragmatic language abilities in a larger participant sample, as well as the complex interplay between cognitive impairment and pragmatic abilities.

Introducing a New Tool for Measuring Domains of Unawareness

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Lack of awareness of deficits is a relatively common disorder affecting patients following a traumatic brain injury (TBI). While lack of awareness is most obvious when the patient lacks awareness for a physical deficit (e.g., hemiplegia), it has also been reported for cognitive (e.g., speech), behavioural (e.g., personality change), and emotional (e.g., depression) domains of impairment. Current literature also suggests that 3 distinct types of unawareness may exist; specifically, awareness of severity, awareness of functional consequences and ability to set realistic goals. While there is a wide range of tools in the current literature designed to measure lack of insight, only the Self Awareness of Deficits Interview (SADI) (Flemming &

Strong, 1995) attempts to operationalise the distinction between the different types of unawareness. Another gap in the literature concerns the lack of instruments for assessing insight that can be used over time with patients to delineate the time-course and the domains of emerging awareness. The current study introduces a new tool that was designed to address these limitations of current instruments for measuring unawareness in patients following TBI. Specifically, this new interview tool allows lack of insight in patients to be categorised according to the type and the domain of unawareness deficit they present and it can be used to track the changes in unawareness that occur over time. Preliminary results, including psychometric properties, will be discussed.

Prospective Memory in the Prefrontal Cortex

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Introduction: Prospective memory (PM) is the ability to remember to perform an intended action in the future (Ellis & Kvavilashvili, 2000). It is essential for everyday functioning because failure to remember to do something can be dangerous and life threatening. To date, no studies have assessed PM in individuals with localised prefrontal lobe lesions. However, there is growing evidence (e.g., fMRI) to support the role of the prefrontal cortex in PM. *Method:* Eleven participants with injury to the frontal lobe were compared to those without. Further, non-injured participants across the lifespan (ages 25–60 and 70+ years) were compared, to determine differences as a result of ageing in the frontal lobe. PM was measured using a story reading task during which one word (viz., Lower) had to be substituted with another word (viz., Upper). This task lasted for 10 min and there were 14 PM cues. *Results:* Participants with injury to the frontal lobe scored significantly lower than controls on the PM task. Similarly, older participants scored significantly lower than the younger controls. There were no significant differences between the older participants and those with frontal lobe injury. *Discussion:* PM problems in individuals with prefrontal injury were mostly due to ‘self-correction’ errors, in which the participant remembered to complete the task after the cue had been read. This suggests that impulsivity, a frontal lobe function, may have interfered with PM remembering. Elderly participants performed significantly worse than their younger counterparts, but similar to the frontal lobe group. This suggests that ageing may also affect frontal lobe functioning on PM tasks.

Integrity and Development of Executive Function 10 Years After Childhood Traumatic Brain Injury

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The impact of brain injury on skills that allow individuals to engage in purposeful, goal-directed and appropriate behaviour, commonly conceptualized as executive functions, has been a focal point of research into the cognitive outcomes of paediatric traumatic brain injury (TBI). However, few studies have addressed the long-term evolution of executive deficits in patients injured during childhood. Forty children with TBI were followed longitudinally and assessed 10 years post-injury (25 male, mean age at injury = 2.0, SD = 2.7, mean age at follow-up = 14.7, SD = 0.7) and compared to 19 healthy developing children (12 male, mean age at follow-up = 14.2, SD = 2.3) on a battery of tests measuring a range of executive functions including attentional control, inhibition, cognitive flexibility, planning, goal setting, problems solving and abstract reasoning. Results revealed that patients with mild and moderate injuries performed at age-expected levels on all tests; however severely injured patients demonstrated significant deficits particularly on complex executive functions such as planning, $F(2, 54) = 3.3$, p =.02), problem solving, $F(3, 55) = 3.4$, $p = .02$, and abstract reasoning, $F(48, 3) = 5.1$, $p = .004$. These findings highlight the lasting effects of childhood brain injury on complex executive skills and suggest that severely injured children may require ongoing intervention and support for cognitive deficits into adolescence and early adulthood.

Factor Analysis of the Beck Depression Inventory-II With a Neurorehabilitation Inpatient Sample

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Introduction: Depression is common after stroke, traumatic brain injury (TBI) and conditions such as Parkinson's and multiple sclerosis. Thus it is essential that good measures exist to assess the severity of depression in neurorehabilitation. Our aim was to psychometrically evaluate the Beck Depression Inventory-II (BDI-II) for use with complex neurorehabilitation patients. Previous studies have focused on one diagnostic group or too small a sample. *Methods:* Participants were 353 inpatients of a specialist neurorehabilitation unit in London. Diagnoses included stroke/vascular (60%), TBI/hypoxic (17%), spinal cord injury (5%), Guillian Barre/Transverse myelitis (4%), other neurological conditions (13%). Participants were administered the BDI-II individually by a clinical psychologist. Analyses included exploratory factor analysis and a confirmatory factor analysis on a randomly selected subsample of participants. *Results:* Using principal components analysis and varimax rotation we examined 2–5 factor solutions. Results suggested a large general depression factor and two specific factors of *cognitive/affective* and *somatic symptoms*. We selected a random subsample of 200 patients and used confirmatory factor analysis to compare solutions for goodness-of-fit. A single factor model demonstrated good fit although the two-factor model was even better. Coefficient alpha demonstrated high reliability for the full measure and subscales. *Discussion:* Both exploratory and confirmatory factor analysis supported the use of the BDI-II in neurorehabilitation. While a single total score is a satisfactory measure of low mood clinicians should also be aware of the multi-dimensionality present in the BDI-II. Our results are compared with previous studies and current work using modern item response methods is mentioned.

A Psychometric Evaluation of the Zarit Burden Interview for People Caring for a Family Member With Acquired Brain Injury

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Introduction: The Zarit Burden Interview (ZBI) was developed to measure 'carer burden' in people caring for a family member with dementia. We examined the psychometric properties of the ZBI with people caring for a family member with acquired brain injury. In particular we focused upon how many dimensions underpin the construct of 'burden' as measured by the ZBI. *Methods:* Participants were 220 adult carers of a family member with an acquired brain injury. Causes of brain injury included: traumatic brain injury (49%), stroke (26%), encephalitis (18%), hypoxia (4%) and 'other' (3%). Carers were mostly female (81%) with a mean age of 54 ($SD = 10.9$). The ZBI was completed as part of a national mail survey on the impact of acquired brain injury on carers. *Results:* We used principal components analysis and varimax rotation to explore the factor structure of the ZBI. Nineteen of 21 items loaded high on the first principal component suggesting a large general factor underlying the measure. Internal consistency was excellent (coefficient alpha = 0.93). We rotated three factors based on a Scree plot and this yielded three interpretable factors with good simple structure. The three factors were labelled 'personal strain', 'role strain' and 'guilt'. *Discussion:* Our findings are compared with previous solutions reported for samples of dementia carers. The ZBI is a reliable measure with three interpretable factors that can be used to measure burden among acquired brain injury carers. Current work using Rasch analysis on the ZBI will be outlined.

Predictors of Mobility Status on Discharge for Children With TBI: A Retrospective Review at Sydney Children's Hospital

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Traumatic brain injury (TBI) is a major cause of disability in children. Physiotherapy aims to assist and maximise physical recovery and safe mobility on discharge is a primary goal. Paediatric patients, aged 2 to 18 years who sustained a TBI during 2006 and 2007 were identified from the rehabilitation database. Retrospective information was collected for children and adolescents admitted to the Sydney Children's Hospital Brain Injury

Rehabilitation Program (SCH BIRP) using the database and patient medical records. Data regarding age, gender, injury (mechanism and severity) and duration of hospital stay were analysed. Physiotherapy interventions, mobility aids at discharge, discharge location and referral to local services were also considered in attempting to identify predictors of mobility outcome in children who have sustained a TBI.

Self-Care Outcomes in Patients With a Dual Diagnosis of Spinal Cord Injury (SCI) and Traumatic Brain Injury (TBI)

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Objectives: To compare the self-care outcomes of persons with dual diagnosis (DD) of spinal cord injury (SCI) and traumatic brain injury (TBI) and persons with SCI only. To analyse the relationship between TBI severity and self care outcomes. *Research Design:* Retrospective, cross sectional, descriptive study comparing self-care outcomes for DD patients and SCI only patients. *Method:* Medical records of two matched groups of DD (n = 22) and SCI only (n = 25) patients with paraplegia were audited. Functional Independence Measure (FIM^{TM}) total and subscale scores at discharge were compared between groups. The relationship between FIM^{TM} scores and two indices of TBI severity was examined. *Main Measures:* FIM^{TM}, Westmead Post Traumatic Amnesia (PTA) Scale, Glasgow Coma Scale. *Results:* Clients with DD of TBI and SCI had significantly poorer outcomes in upper limb dressing, bladder and bowel management, transfers and wheelchair operations. TBI severity was significantly correlated with eating, upper limb dressing and wheelchair operations. *Discussion:* Findings illustrate the challenges faced by DD clients in achieving self-care independence even for those with intact upper limb function to learn basic activities. This suggests the need for greater emphasis on cognitive retraining strategies when relearning basic activities for this group.

Developing a Structured Pre-Admission Screening Process to Assist in the Management of a Community Brain Injury Rehabilitation Residential Site

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Management of aggressive behaviour in clients with acquired brain injury (ABI) can be very challenging. Lack of effective management strategies and failure of the organisation to reflect and learn from these incidents can contribute to staff stress levels, indirectly influencing patient/client care in a negative way. This report was prepared with the aim of improving the work environment for both staff and clients to enable staff to focus their efforts on rehabilitation rather than dealing with situational crises. Initial staff surveys confirmed high stress levels among staff with the most identified cause being violent and aggressive client behaviour. This survey indicated a need for change in the 24-bed ABI rehabilitation unit. More structured and consistent pre-admission assessments incorporating predictors of aggressive behaviour is the suggested initial management strategy. Using a red flag system for clients with a history of substance abuse, mental health diagnosis or a history of violence, could give more informed and less subjective decision-making at admission. A more uniform tool to assess substance abuse is also required, considering this is a predictor for aggression in clients with ABI. The use of an abuse screening tool along with the red flag system and admitting only one client who has a 3 red-flag status at any one time is recommended. The research leading to this recommendation, and a clear description of the recommendation will be discussed. The view is then for a 6-month trial and data collection period to compare to the results in this initial report. Outcomes will focus specifically on the frequency and severity of adverse behaviour incidents.

Building Better Lives Ambassadors: Empowering Young People in Nursing Homes

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There are 1000 Australians under the age of 50 living in aged care facilities. The most common disability type of young people in aged care is brain injury (61%). In 2006, the State and Federal governments committed $244 million over 5 years to the issue of younger people living in aged care.This is a tremendous start but does not have the resources to resolve the issue of young people in aged care. The *Building Better Lives* initiative aims to engage the business community and general public, create momentum and ensure that the state and federal governments continue to be proactive in developing alternatives for young people living in aged care and preventing new admissions at the end of the current 5-year initiative. The initiative is modelled on the *Make Poverty History* campaign, where a range of organisations work toward the same goal under the one banner. This initiative will foster collaboration and a coordinated approach, which is more effective than each organisation working in isolation. The Ambassadors Program is integral to the *Building Better Lives* initiative. Young people in nursing homes are some of the most marginalised and disempowered people in our society. The *Ambassador Program* is engaging a representative group of young Victorians in nursing homes. The program supports the ambassadors to effectively and publicly share their stories and their journey into age-appropriate accommodation. This program will enable young people in nursing homes to actively engage in decision-making and have a significant impact on disability policy and expenditure.

Re-Engagement in Leisure Activities During Brain Injury Rehabilitation

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Primary objective: To describe and compare pre- and post-injury leisure activities of individuals receiving brain injury rehabilitation and explore levels of leisure participation and satisfaction. *Research design*: Cross sectional, descriptive study incorporating a survey of current and past leisure activities. *Methods and Procedures*: Questionnaires were completed by 40 individuals with an acquired brain injury receiving inpatient or outpatient rehabilitation. *Measures*: Shortened Version of the Nottingham Leisure Questionnaire and Changes in Leisure Questionnaire (developed for this study). *Results*: Leisure participation declined following injury, particularly in social leisure activities. Pre-injury activities with high rates of discontinued or decreased participation were driving, going to pubs and parties, do-it-yourself activities and attending sports events. Inpatient participants generally attributed decreased participation to the hospital environment, whereas outpatient participants reported this predominantly as a result of disability. Post-injury levels of perceived leisure satisfaction were significantly lower for the inpatient group compared to pre-injury, but not for the outpatient group. Uptake of some new leisure activities was reported post-injury, however not at the rate to which participation declined. *Discussion:* Leisure participation decreases during brain injury rehabilitation compared to pre-injury levels. Re-engagement in relevant, age-appropriate leisure activities needs to be addressed during rehabilitation to improve participation in this domain.

Participation Following Paediatric Brain Injury

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Introduction: Participation, or 'involvement in a life situation' (World Health Organization, 2001, p. 12) is an important consideration when describing rehabilitation outcomes. Participation is important for psychological, emotional and physical skill development (Law, 2002), with children experiencing improved quality of life outcomes through participation (Bedell, Cohn, & Dumas, 2005). There is currently very little information available about patterns of participation for Australian children who have sustained acquired brain injuries (ABI). *Aims:* To describe the participation in home, school and community life of children who have sustained ABI and investigate the impact of children's environment and ABI related impairments on participation. *Methodology:* Parents of 20 school-aged children who attended the ABI review clinic at the Royal Children's Hospital (RCH) completed the Child and Family Follow-up Survey (Bedell, 2004). Children were aged 5 to 15 and had been discharged from rehabilitation for a minimum of 3 months (range 3 months to 4 years). *Results:* Children were reported to have the greatest restrictions for structured events in the community, and social, play or leisure activities with peers at school and in the community. Children were least restricted in moving around their homes. Child and environmental factors were related to the children's participation scores, with greater extent of child or environment-related problems correlated with lower participation scores. *Discussion:* This study provides a description of the patterns of participation of children with ABI in Victoria. Understanding participation restrictions of children with ABI, will assist professionals to further develop rehabilitation programs with a focus on improving participation, particularly school and community based activities.

Traumatic Brain Injury and Secondary Psychosis

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Our understanding of psychosis secondary to traumatic brain injury (TBI) remains in its infancy. Estimates suggest that approximately 10% of patients who have experienced a TBI go on to develop psychotic symptoms. These result in significant patient distress and disability, and can complicate broader aspects of rehabilitation. Existing literature indicates that the precise relationship between TBI and the presence of psychotic symptoms is extremely complex and perhaps individually unique; studies show a highly variable range of psychosis onset, progression and course. This poster reviews the current literature and summarises the common features of psychotic experiences following a traumatic brain injury. Symptom trends that are distinctive of psychosis secondary to TBI may indicate the potential for a separate diagnostic category.

Sentinel Events in the Transition From Hospital to Home for Individuals With Traumatic Brain Injury and Their Family Caregivers

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Background: A key transition period following a traumatic brain injury (TBI) occurs as the individual moves from hospital to home. Previous research has identified that this is a highly emotional time and a period of adjustment as individuals and families re-organise their life and sense of self. Several sentinel events have been identified in the transition phase including financial strain, relationship breakdown, moving to a more restricted living environment, difficulty accessing therapy, returning to work, independently travelling in the community, increased independence in the home environment, and returning to driving. *Aims:* This poster presentation aims to:

- Review relevant literature surrounding the transition from hospital to home for individuals with TBI,
- Report preliminary findings relating to the occurrence of sentinel events at predischarge and 1-, 3- and 6-month follow-ups

Methods: Quantitative data is collected at four time intervals within the first 6-months following hospital discharge using a Sentinel Events Questionnaire and a Visual Analogue Scale (VAS) to measure perception of transition success. Data will be presented from approximately 50 individuals with TBI and family members to date. *Results:* The period of time between 1 and 3 months post discharge appears to be significant in the transition phase with greater numbers of participants reporting sentinel events. *Conclusions:* These trends highlight time periods and events important in rehabilitation to support individuals with TBI to move from hospital to home.

A Survey of Adult Power Wheelchair and Scooter Users

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Introduction: People with acquired brain impairment often use power mobility devices for community outings. Power wheelchairs and scooters are expensive and may not always be considered an option by health professionals during rehabilitation despite the potential for increased community participation. The aims of this study were to investigate the characteristics of adults who use power wheelchairs and scooters, to explore the process of power mobility provision, and examine the associated benefits and challenges. *Methods:* A cross-sectional survey was used to collect data from current users of a power wheelchair or scooter, aged over 18, or their carer. The self-administered survey, developed especially for this study, collected data on demographics, the process of selection, purchase and servicing and was distributed by mail and email to equipment suppliers, disability organisations and peak bodies. *Results:* Of the 202 usable surveys returned, 25% were from power wheelchair users and 74% from scooter users. A sizable proportion of respondents (12%) reported having had a stroke that affected their ability to walk. Users reported many benefits, including increased independence and quality of life. However, respondents also reported challenges including barriers to community access and accidents. A sizable proportion of respondents (21%) reported having an accident in the previous year which often resulted in personal injury and damage to their device. Health professionals often were not consulted prior to purchase of power mobility devices. *Discussion:* Power mobility devices can enable participation by adults with acquired brain impairment. To maximise safety, health professionals should aim to ensure new users receive some formal training, in order to reduce accidents and injuries.