



HEADlines

Newsletter of Monash-Epworth Rehabilitation Research Centre

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In this issue, we review recent conference presentations on psychiatric disorders following traumatic brain injury, our world-first research treating fatigue and sleep disturbance following acquired brain injury, post-concussive symptoms in children with mild traumatic brain injury and the neurocorrelates of attention and working memory in traumatic brain injury. We also describe research being conducted in collaboration with Professor Mark Sherer and colleagues at TIRR Memorial Hermann Houston, Texas, USA, to identify clusters of individuals with traumatic brain injury according to their outcomes.

IBIA



MERRC members who formed part of the symposium. Professor Jennie Ponsford, Kate Gould, Yvette Alway and Gershon Spitz.

At the 11th World Congress on Brain Injury held in The Hague, The Netherlands, on 2-5 March 2016, Jennie Ponsford, Kate Gould, Yvette Alway and Gershon Spitz presented a series of papers documenting a body of research on the nature, time-course and treatment of psychiatric disorders following traumatic brain injury (TBI). Kate Gould described psychiatric disorders in the first year after TBI, the most common of which are anxiety and depression, occurring commonly in individuals with a history of psychiatric disorder but also commonly in individuals with no history of such disorder. Yvette Alway presented data showing the evolution of these disorders 1-5 years post-injury. Depressive and anxiety disorders, including PTSD tend to peak at

12 months post-injury and decline thereafter, with anxiety disorders showing greater resolution than depressive disorders, which persist in almost a third of cases even five years post-injury. Gershon Spitz presented data showing that patterns of white matter disruption were associated with presence of mood disorders, supporting a biological basis of these disorders. Jennie Ponsford presented findings from a randomized controlled trial showing that adapted CBT can alleviate anxiety and depression symptoms following TBI and discussed ways in which therapy can be adapted to accommodate the unique needs and cognitive impairments of these individuals.



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Cognitive Behaviour Therapy (CBT) for fatigue and sleep disturbance following acquired brain injury (ABI)

Sylvia Nguyen (BHealth Sci, MPsych (Clin)) is a registered clinical psychologist and research assistant at the Monash Epworth Rehabilitation Research Centre (MERRC). She is currently a Doctor of Psychology (Neuropsychology) candidate at Monash University and her thesis is on evaluating the effectiveness of Cognitive Behaviour Therapy (CBT) for fatigue and sleep disturbance following acquired brain injury (ABI). She is also a member of the Moving Ahead Centre of Research Excellence in Brain Recovery and the Team Leader of the Australasian Society for the Study of Brain Impairment (ASSBI) Victorian student ambassadors.

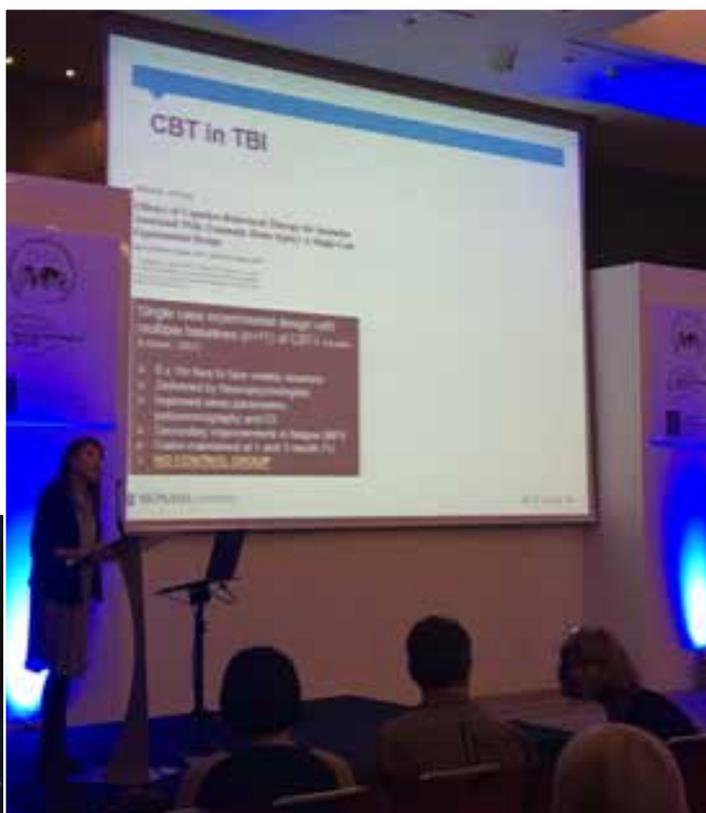
Fatigue and sleep disturbances are frequent debilitating problems following brain injury yet there are no well-established treatment guidelines at present. CBT is an evidence-based treatment for insomnia and chronic fatigue in those without a brain injury. The MERRC is conducting a world first study to investigate whether CBT can be adapted to reduce symptoms of fatigue and poor sleep after ABI. A randomised controlled trial is being used to compare participants receiving 8 sessions of CBT with a neuropsychologist to waitlisted participants who receive routine care as usual. The trial is ongoing but pilot data is promising and demonstrates significantly greater improvements in sleep quality, daily fatigue levels and depression following therapy. Positively, treatment gains are maintained up to two months after treatment has finished. The research findings have been presented by Sylvia at four international conferences over the past year: the International Neuropsychological Society (INS) in Sydney 2015,



Poster presentation at FESN in Finland 2015, Sylvia (right) with Professor Jennie Ponsford.

Federation of the European Societies of Neuropsychology (FESN) in Finland 2015 and at the World Congress of Behavior Cognitive Therapy (WBCBT) held in Melbourne this year. In July 2016 she presented in a symposium with Prof Jennie Ponsford, Dr Adam McKay and Dr Dana Wong at the International Neuropsychological Society 2016 conference in London.

In her role as a research assistant at MERRC, Sylvia is presently the project coordinator for the CBT fatigue/sleep study and conducts follow-up interviews on the Positive Behavior Study. She has also been involved with the Prospective Psychiatric Study and the national Neurotrauma Evidence Translation Trial focusing on outcomes after mild traumatic brain injury.



Symposium presentation at INS in London 2016.

Post-concussive symptoms following mild TBI in young children

Coco Bernard BSc (Hons), DPsych (Clinical Neuropsychology) Candidate, adopted a prospective longitudinal design to investigate outcomes following mild TBI, or 'concussion' in young children aged 2 – 12, and to identify which factors predict poorer outcomes in this population. Results from the study demonstrated that the number of post-concussive symptoms (PCS) peaked in the acute phase post-injury, reduced significantly from 1 week to 1 month post-injury, but remained persistent in a significant minority (18%) of children who sustained mTBI compared with 5% of trauma controls. The more persistent symptoms tended to be behavioural and sleep-related in nature. The best predictors of PCS in the first week after mTBI were injury related factors, however their association with more persistent symptoms weakened over time. On the other hand, pre-existing child and family factors (e.g. pre-existing learning difficulties, behavioural disturbance, and increased levels of parental stress) were the best predictors of PCS at three months post-injury and beyond. This is one of the few studies that has really characterised PCS and predictors of outcome in such a young population, and has offered important insights for development of management strategies and interventions.

Over the last year, Coco has presented her research findings at four major international conferences, including; the International Neuropsychology Society meetings in Sydney (2015) and London (2016), the International Paediatric Brain Injury Society meeting in Liverpool, England (2015) and at the Federation of the European Society of Neuropsychologists in Tampere, Finland (2015). She has also recently had a paper accepted for publication in the Journal of the International Neuropsychological Society. She submitted her doctoral thesis in September, 2016.

Whilst completing her doctoral thesis, Coco has worked as a Research Assistant at MERRC for four years. Her work has largely involved conducting follow up interviews with patients as part of the longitudinal outcome study, and cognitive assessment as part of the US collaborative study.



Poster presentation at the European Society of Neuropsychologists conference in Tampere, Finland, 2015.

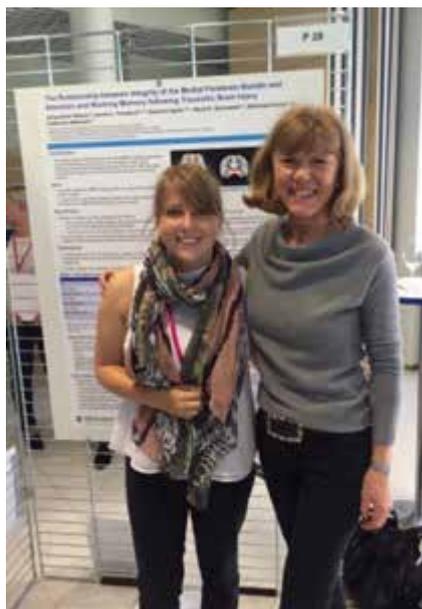


Oral presentation at the International Paediatric Brain Injury Society conference, September 9th 2015, Liverpool, England.

Neurocorrelates of attention and working memory deficits following TBI

Jacqui Owens BSc (Hons) is currently a Doctor of Psychology (Neuropsychology) candidate at Monash University and her thesis is investigating the neurocorrelates of attention and working memory deficits following traumatic brain injury (TBI). Attention and working memory deficits are frequent following moderate to severe TBI, and can greatly impact an individual's ability to work, study and function in everyday life. They are complex cognitive skills that rely on many different brain regions connected by white matter pathways, as well as neurochemical systems, particularly the dopamine (DA) system. The damage caused by TBI may disrupt these brain systems, potentially leading to attentional difficulties, such as poor concentration. Using diffusion tensor imaging (DTI), an imaging technique more sensitive to changes within white matter tracts, the majority of white matter tracts within the brain were found to show signs of damage following TBI. Additionally, reduced speed of information processing (i.e. slowed speed of thinking) was found to be associated with changes to white matter tracts.

Alterations to the DA system were also identified following TBI.



Poster presentation at the European Society of Neuropsychologists conference in Tampere, Finland, 2015.

The medial forebrain bundle, a key white matter pathway in the DA system, was found to show microstructural alterations post-TBI. In addition, using resting-state functional magnetic resonance imaging (rs-fMRI), an imaging technique able to measure how efficiently brain areas communicate together, alterations to the DA functional network were identified following TBI. Interestingly, no significant associations were found between these changes to the DA system and performance on attention tasks.

Jacqui has presented her research findings at two international conferences, including the International Neuropsychology Society meetings in Sydney (2015), and the Federation of the European Society of Neuropsychologists in Tampere, Finland (2015). She submitted her thesis in November 2016.

As a research assistant at MERRC, Jacqui is currently the project coordinator for the Light Therapy for Sleep and Fatigue study, conducts the follow-up assessments for the CBT for Sleep and Fatigue Study, and completes follow-up phone interviews as well as cognitive assessments for the Longitudinal Outcomes Study.

Identifying clusters of individuals with TBI according to outcomes

The Monash-Epworth Rehabilitation Research Centre (MERRC) is currently participating in an international collaboration with Professor Mark Sherer and colleagues at TIRR Memorial Hermann Houston, Texas, USA. The aim of this collaboration, funded by the Institute for Safety, Compensation and Recovery Research (ISCRR) as well as the US Department of Education, is to identify clusters of individuals with traumatic brain injury according to their outcomes. We found that individuals clustered into five groups, based on their differences on 12 measures that assessed cognition, personal strengths, environmental, and performance/symptom validity factors. These five groups did not differ on injury severity measures, including duration of post-traumatic amnesia and Glasgow Coma Score, confirming that factors other than severity of injury contribute to longer-term outcomes. The results highlighted the presence of a good recovery group, which reported

better community participation outcomes and less frequent service utilization. This group displayed intact cognitive functioning, denied cognitive, post-concussional or physical symptoms, showed high independence, self-esteem and resilience, low emotional distress and had good economic and family support. Conversely, two groups were identified that were characterized by poorer outcomes associated with greater emotional distress, low economic and family support, low resilience and greater service utilization. This study has thus identified factors other than injury severity that contribute to long-term levels of participation and service utilization costs. The results confirm that distinct clusters exist following a traumatic brain injury that differ on the personal strengths of the individual—including independence and self-esteem and resilience—as well as economic and family support, their level of emotional distress and motivation to recover.



FOR CURRENT/PAST PARTICIPANTS WHO ARE INVOLVED IN OUR RESEARCH STUDIES, CONTACT DETAILS CAN BE UPDATED VIA OUR WEBSITE [HTTP://WWW.MED.MONASH.EDU.AU/PSYCH/RESEARCH/CENTRES/MERRC/PARTICIPANTS.HTML](http://www.med.monash.edu.au/psych/research/centres/merrc/participants.html)



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