

Final Program & Abstracts

International Neuropsychological Society 2015 Mid-Year Meeting / 5th ASSBI Pacific Rim Conference

July 1-4, 2015
Sydney, Australia

WEDNESDAY, JULY 1, 2015

8.00-9.00	Registration at Registration Desk Outside the Cloak Room Tea/coffee/break item on arrival in Grand Ballroom Foyer and Brisbane Room		
9.00 – 4.00	Workshops		
	9.00-12.00 Workshop 1 Presenter: Prof Leeanne Carey Chair: Guy Vingerhoets Venue: Perth Room Title: <i>Beyond the Lesion – Neuroimaging foundations for post-stroke recovery and rehabilitation</i>	9.00-12.00 Workshop 2 Presenters: Profs Terrie Inder, Jeffrey Neil and Peter Anderson Chair: Peter Anderson Venue: Sydney Room Title: <i>Foetal and neonatal brain development – What are the neuropsychological consequences of biological and environmental insults?</i>	9.00-12.00 Workshop 3 Presenter: Prof Angelle Sander Chair: Dana Wong Venue: Melbourne Room Title: <i>ACT for Success: Application of Acceptance and Commitment Therapy for Persons with Traumatic Brain Injury and Emotional Distress</i>
10.30-10.45	Morning Tea in Grand Ballroom Foyer, Canberra and Brisbane Rooms		
12.00-1.00	Lunch in Grand Ballroom Foyer and Brisbane Room for delegates attending TWO workshops brought to you by Shine Lawyers		
12.30-1.00	Registration at Registration Desk Outside the Cloak Room		
	1.00-4.00 Workshop 4 Presenter: Prof Mark Sherer Chair: Jennie Ponsford Venue: Perth Room Title: <i>Early Assessment of Patients with TBI</i>	1.00-4.00 Workshop 5 Presenter: A/Prof Raul Gonzalez, Profs Jan Copeland, Murat Yucel Chair: Raul Gonzalez Venue: Sydney Room Title: <i>Of Brains and Bong: The Neuropsychology of Cannabis Use Disorders and their Treatment</i>	1.00-4.00 Workshop 6 Presenter: Profs Roy Kessels and Luciano Fasotti Chair: Roy Kessels Venue: Melbourne Room Title: <i>Cognitive rehabilitation of complex everyday tasks</i>
2.30-2.45	Afternoon Tea in Grand Ballroom Foyer and Brisbane Room		
4.00	Workshops CLOSE		
4.30-8.00	Welcome and Awards		
4.30-5.00	Chair: Prof Jennie Ponsford Venue: Grand Ballroom		
5.00-5.15	Indigenous Welcome and Smoking Ceremony – Matthew Doyle and Group		
5.15-5.30	Welcome and housekeeping comment – Prof Jennie Ponsford		
5.30-6.15	ASSBI Fellowship and thanks to Editors – A/Prof Tamara Ownsworth		
	INS AWARDS Chair: Dr Robert Heaton Nelson Butters Award – Gershon Spitz ; <i>Predicting cost of care following traumatic brain injury</i> Laird Cermak Award – Rachel Buckley ; <i>Autobiographical narratives relate to Alzheimer's disease biomarkers in older adults</i> Phillip M. Rennick Award – Joyce Kootker ; <i>Effectiveness of augmented Cognitive Behavioural Therapy for post-stroke depression with or without anxiety (PSDA): the Restore4stroke PSDA trial</i> Marit Korkman Award – Elisha Josev ; <i>Cerebellar-cortical connectivity contributes to working memory function in children born extremely preterm</i> The Paul Satz-INS Career Mentoring Award – Prof Jennie Ponsford INS Distinguished Career Award – Dr Jenni Ogden The Arthur Benton (Mid-Year) Award – Prof John DeLuca		
6.15-7.00	Benton Award Talk Prof John DeLuca - <i>Cognitive Rehabilitation in Multiple Sclerosis</i>		
7.00-7.45	Epworth HealthCare Opening Address Prof Paul McCrory - <i>Short and long term consequences of sports concussion - media myth or scientific fact?</i>		
7.45-7.50	Welcome Reception welcome - Jamie Shine, Partner and Practice Leader for Major Claims at Shine Lawyers		
7.45 – 10.00	Shine Lawyers Welcome Reception		

A selection of the abstracts of the 5th INS/ASSBI Pacific Rim Conference 2015 will also be published in a forthcoming issue of *Brain Impairment*, the official journal of ASSBI, and will soon be available at <http://dx.doi.org/10.1017/BrImp.2015.31>.

WEDNESDAY ABSTRACTS

Workshop 1

Beyond the Lesion – Neuroimaging foundations for post-stroke recovery and rehabilitation

Carey, Leeanne¹

¹Neurorehabilitation and Recovery, Stroke Division, The Florey Institute of Neuroscience and Mental Health and Professor, Department of Occupational Therapy, School of Allied Health, Faculty of Health Sciences, La Trobe University, Australia

A shift is emerging in the way we view post-stroke recovery. This shift is supported by evidence from neuroimaging studies to look beyond the lesion and to identify viable brain networks with capacity for plasticity. In this workshop I will review current advances in neuroimaging techniques and the new insights they contribute to better understanding stroke recovery and response to rehabilitation. Evidence of changes in remote networks, changes of functional and structural connectivity, and alterations in cortical thickness will be presented and reviewed in the context of their impact on post-stroke recovery. The value of monitoring spared structural connections and functional connectivity of brain networks within and across hemispheres is highlighted.

Learning Objectives:

At the end of this workshop, participants should be able to:

1. Describe the role of magnetic resonance imaging (MRI) in elucidating structural changes affecting post stroke recovery and rehabilitation;
2. Distinguish functional activation in post stroke recovery as determined by neuroimaging techniques;
3. Identify connectivity of brain regions and networks visualized by neuroimaging techniques in post stroke recovery;
4. Describe the impact of stroke on remote brain networks; and Recognize the role of viable brain networks in recovery and rehabilitation

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Workshop 2

Fetal and neonatal brain development – What are the neuropsychological consequences of biological and environmental insults?

Neil, Jeffrey Neil¹; Inder, Terrie² and Anderson, Peter³

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²Department of Pediatric Newborn Medicine, Brigham and Women's Hospital, Harvard Medical School, USA

³Clinical Sciences, Murdoch Childrens Research Institute, Melbourne, Australia

Unparalleled brain growth and development occurs during the fetal and neonatal period, setting the platform for all subsequent brain maturation. However this remarkable period of brain development is also incredibly sensitive to biological and environmental events that can disrupt highly programmed maturational processes. For example, brain development in children born very preterm has been reported to be influenced by drugs administered to the mother prior to birth, drugs administered to the infant, environmental stress, isolation, and nutritional factors.

Learning objectives:

At the end of this workshop, participants will be able to:

1. Describe normal brain development processes during the fetal and neonatal periods;
2. List neuroimaging techniques that allow early brain injury and development to be studied including myelination and cortical folding;

3. Explain the vulnerability of the fetal and neonatal period by describing specific biological and environmental events that can result in brain injury and/or alter normal brain development processes, and
4. Describe the long-term neuropsychological consequences of early brain injury and altered pattern of brain development.

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Workshop 3

ACT for Success: Application of Acceptance and Commitment Therapy For Persons With Traumatic Brain Injury and Emotional Distress

Sander, Angelle M.¹

¹Baylor College of Medicine and Director, Brain Injury Research Center, TIRR Memorial Hermann, Houston, Texas, USA

Emotional distress occurs in a substantial number of persons with traumatic brain injury (TBI) and is associated with poor participation outcomes. There is minimal evidence to support the effectiveness of psychotherapy in reducing emotional distress following TBI. Traditional psychotherapies, including cognitive-behavior therapy, can have limitations when applied to persons with TBI. This workshop will describe applicability of Acceptance and Commitment Therapy (ACT), "a third wave" behavioral therapy with demonstrated effectiveness in a broad range of populations, to persons with TBI and emotional distress. An 8-week manualized treatment protocol will be described, and case examples from an ongoing clinical trial of ACT in persons with TBI will be presented. The ACT components of Open, Aware, and Active will be described, with examples provided of exercises used to help clients understand these concepts. Examples of homework assignments to reinforce concepts will be provided.

Learning Objectives:

At the end of this workshop, participants will be able to:

1. Have an understanding of the basic components of ACT and how they can be applied to persons with emotional distress following TBI; and
2. Be able to describe how to deal with obstacles to treatment posed by cognitive and behavioral impairments.

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Workshop 4

Early Assessment of Patients with TBI

Sherer, Mark¹

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Brief bedside assessments of persons with TBI may be more appropriate than comprehensive neuropsychological evaluations during the early period of recovery. The ability of the neuropsychologist to complete these assessments and use findings to create a comprehensive case conceptualization including treatment recommendations makes a unique contribution to care for persons with TBI. Key issues such as level of consciousness, post-traumatic confusion, language functioning, overall cognitive functioning, and emotional distress are appropriate for these evaluations. Brief assessments of these issues that are amenable to repeated administration can make several contributions to clinical management. These contributions include feedback to family members regarding patient status, feedback to the patient to improve self-awareness and facilitate active participation in therapies, feedback to caregivers to inform approaches to treatment, documentation of the course of recovery and detection of unexpected worsening, assessment of effects of medication and other interventions, determination of decision

making capacity, determination of safety judgment, and others. Measures reviewed in this workshop will include the Coma Recovery Scale – Revised, the Confusion Assessment Protocol, the Mississippi Aphasia Screening Test, a brief cognitive battery based on the NINDS Common Data Elements recommendations, the Patient Health Questionnaire – 9, and the Generalized Anxiety Disorder – 7.

Learning Objectives:

At the end of this workshop, participants will be able to:

1. Describe how brief bedside assessments contribute to early clinical management of persons with TBI.
2. List areas of neurobehavioral functioning that are amenable to bedside evaluations.
3. Apply appropriate instruments to complete bedside evaluations.

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Workshop 5

Of Brains and Bongs: The Neuropsychology of Cannabis Use Disorders and their Treatment

Copeland, Jan¹ and Gonzalez, Raul²

¹National Cannabis Prevention and Information Centre (NCPIC), UNSW

²Florida International University (FIU) and Director of the Substance Use and HIV Neuropsychology (SUHN) Lab, USA

Cannabis remains one of the most widely used psychoactive substances throughout the world. Over the last decade many countries have seen a growing trend to decriminalize use, as well as growing popular public support for its legalization for medical use. This complex environment and rapidly changing policies have contributed to confusion and controversy among the general community, scientists, policy makers and clinicians alike on the potential adverse and beneficial effects of cannabis and its primary psychoactive constituents. This workshop aims to present and unravel some of these controversies by presenting background on how cannabis affects the brain, its impact on neuropsychological functioning, neuropsychiatric considerations, and its addiction liability, impact on everyday functioning, and treatments for cannabis use disorder. **A/Professor Raul Gonzalez** will introduce the workshop and present background information on the psychoactive constituents of cannabis, the endocannabinoid signalling system, the neuropsychological effects of cannabis, and implications for neuropsychological assessment. **Professor Murat Yucel** will present findings from neuroimaging studies to further elucidate the effects of cannabis on brain functioning as well as covering literature on neuropsychiatric consequences of cannabis use. Finally, **Professor Jan Copeland** will discuss cannabis addiction, adverse health effects, and treatment.

Learning Objectives:

At the end of this workshop, participants will be able to:

1. Describe mechanisms through which cannabis affects the brain;
2. Describe neurocognitive functions affected by cannabis use;
3. Discuss possible differences in effects from medical and recreational use of cannabis on neurocognition;
4. Identify brain systems affected by cannabis use;
5. Describe evidence for neuropsychiatric sequelae from cannabis use;
6. Discuss symptoms of cannabis addiction;
7. Describe current treatments for cannabis addiction.

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Workshop 6

Cognitive rehabilitation of complex everyday tasks

Kessels, Roy¹ and Fasotti, Luciano²

¹Radboud University Nijmegen; and Clinical

Neuropsychologist at the Department of Medical Psychology,

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²Medical Rehabilitation Centre Groot Klimmendaal in Arnhem, The Netherlands.

Executive and memory deficits compromise daily functioning and functional independence. Everyday problems may arise from multiple sources: 1) Patients have slow information processing, particularly relevant in complex tasks that are performed under significant external time pressure, like traffic participation or cooking. 2) In tasks with less time pressure, goal management deficits may prevail ('goal neglect'), basic deficits in the capacity of behavioural goals to guide the selection of appropriate actions. 3) Patients may be unable to monitor their own performance (using feedback and errors), which may result in the implicit consolidation of erroneous responses during learning, enhanced by explicit memory deficits.

For these problems, specific treatment strategies have been designed. For slow information processing Time Pressure Management (TPM) has been developed. For "goal neglect" Goal Management Training (GMT) has been devised. When problems in performance monitoring and explicit memory are present, errorless learning (EL) can be used to teach patients everyday skills. We will explain the fundamentals of TPM, GMT and EL and their application in cognitively impaired patients, also discussion their combination to maximize treatment effects.

Learning Objectives:

At the end of this workshop, participants will be able to:

1. Describe the fundamentals of TPM, GMT and EL
2. Select the type of patients and tasks in relation to these approaches
3. Setup an intervention using one of these approaches

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The Arthur Benton (Mid-Year) Award – Prof John DeLuca

Cognitive Rehabilitation in Multiple Sclerosis

John DeLuca¹

¹Kessler Foundation, West Orange, New Jersey, USA

It is now well established that up to 70% of persons with multiple sclerosis (MS) suffer from cognitive impairment (Chiaravalloti & DeLuca, 2008). Such impairments can have a significant impact on everyday functional activity in persons with MS. Given the frequency and degree of cognitive involvement in persons with MS, and how it affects so many aspects of a person's life (e.g., vocational, familial, social, emotional, cultural) the need for cognitive rehabilitation therapies and programs is clear. The main objective of this presentation will describe the research data on the effectiveness of cognitive rehabilitation in persons with MS.

Compared to studies in stroke and traumatic brain injury, relatively few studies of cognitive rehabilitation exist in persons with MS (O'Brien, 2008). There is modest but growing literature showing that behavioral interventions can significantly improve targeted cognitive processes. This is especially true in the area of learning and memory where targeted interventions designed to improve the strength of the acquisition of information can significantly improve performance. Examples of specific techniques to improve learning and memory will be provided. Recent studies have also shown that cognitive rehabilitation for impaired learning and memory not only improves neuropsychological functioning, but also results in increased functional brain activity on fMRI and functional connectivity in the brain, as well as improved everyday life activity and quality of life (e.g., Chiaravalloti et al, 2012, 2013). There is also emerging support for behavioral interventions to improve attention and executive functioning in persons with MS (Amato et al., 2014; Bonavita et al, 2015; Mattioli et al, 2010). These neuroimaging studies on cognitive rehabilitation will be

reviewed. Overall, the latest research shows that cognitive rehabilitation can be effective and is ready for clinical application for persons with MS.

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Professor Jennie Ponsford – INS Career Mentoring Award – 2015

Professor Jennie Ponsford’s outstanding career mentoring of colleagues and students has had an enormous influence upon the field of Neuropsychology within Australia over a span of more than 30 years, and she is truly deserving of this INS Paul Satz Career Mentoring Award.

An internationally renowned academic, researcher and clinician, she has contributed considerably to the field of traumatic brain injury (TBI) rehabilitation over the course of her career. She is currently Professor of Neuropsychology, Chair of the Clinical Programs Committee and Convenor of the Doctorate of Psychology (Clinical Neuropsychology) in the School of Psychological Sciences at Monash University. She is also Director of the Monash-Epworth Rehabilitation Research Centre at Epworth HealthCare.

In 2013 Jennie was awarded the Robert L. Moody Prize for Distinguished Initiatives in Brain Injury and Rehabilitation for her lifetime contribution to the field. She is immediate past-President of the International Neuropsychological Society (INS), and has published 2 books, 16 book chapters and over 180 journal articles, more than 100 of which have been co-authored with her students, which have been cited more than 4,200 times (Scopus, 2014). Over the course of her career, she has been awarded over 13million dollars in grant funding.

Jennie has supervised 15 Honours students and 45 Masters or Doctoral students over the course of her career, and has counselled and advised numerous colleagues as they have transitioned into academia. As her colleagues, we believe that Jennie has made a remarkable contribution to the training of a

whole generation of neuropsychologists as client-centred scientist-practitioners. In 2014 she was awarded the Monash Postgraduate Association “Supervisor of the Year” Award. This is a University wide award for which she was nominated by 14 of her current postgraduate students, and is certainly an outstanding achievement.

Her involvement and interest in her mentees extends beyond the successful execution of Honours/Doctoral research projects. She takes genuine interest in their career development and skilfully provides mentoring and support during and after degree confirmation. Indeed, Jennie has assisted many to find employment within the field of neuropsychology. A list of past mentees’ current positions has been included with this application, which outlines the extent and breadth of the diverse careers within Neuropsychology that those advised by Jennie have embarked upon. These have included senior academic positions at leading Australian universities, clinical roles within the Health Sector and administration of a Private Practice. Jennie has also contributed substantially to guiding and supporting others outside the field of Neuropsychology, particularly in the areas of Rehabilitation Medicine, Occupational Therapy, Speech Pathology and Physiotherapy, and a number of colleagues consider her a lifelong mentor.

As one of her colleagues, Professor Pamela Snow, recently communicated, Jennie has always embodied the distinction between management and leadership. Managers keep things on track and on budget, leaders forge new frontiers and take teams into exciting, challenging and sometimes contested territory. She is a true leader – and we are so incredibly grateful for the journey that Jennie has taken us on.

Catherine Willmott, PhD
Co-Director - Monash Psychology Centre
& Senior Lecturer (Clinical Neuropsychology)
July 2015

THURSDAY, JULY 2, 2015

7.00 – 9.00	REGISTRATION at Registration Desk in Grand Ballroom Foyer Tea/coffee/break item on arrival in Grand Ballroom Foyer and Brisbane Room			
7.00 – 8.30	Put Posters up			
7.30 – 8.30	Workshop 7 Chair: Dana Wong Venue: Adelaide Room (4th floor) Presenter: Prof Barbara A. Wilson Title: <i>Connecting with others: Writing for Publication: papers, chapters and books</i>			
8.30 – 9.00	POSTER SESSION 1 - Brisbane Room			
9.00-10.45	PLENARY 1 Venue: Grand Ballroom Chair: Jennie Ponsford			
9.00 – 9.15	WELCOME – Prof Jennie Ponsford			
9.15 – 10.00	International Keynote Speaker: Prof John Hodges <i>Frontotemporal dementia in the context of the genetic revolution</i>			
10.00 – 10.45	National Keynote Speaker: Prof LeeAnne Carey <i>Stroke Rehabilitation: Translating Neuroscience to Neurorehabilitation</i>			
10.45 – 11.15	MORNING TEA in Grand Ballroom Foyer and Brisbane Room			
11.15 – 12.45	CONCURRENT SESSIONS 1 – 4			
	Session 1: Concussion in sport: long-term Impact Venue: Perth Room Chair: David Maddocks	Session 2: Understanding and supporting optimal psychosocial outcomes following brain injury across childhood and adolescence Venue: Sydney Room Chair: Vicky Anderson	Session 3: <i>Behaviours of concern following Brain Injury</i> Venue: Melbourne Room Chair: Jacinta Douglas	Session 4: <i>Cognitive function in degenerative and vascular disease</i> Venue: Adelaide Room (4 th floor) Chair: Guy Vingerhoets

	<p>Paul McCrory <i>Retired footballer study – initial findings and implications</i></p> <p>David Maddocks <i>Long-term impact of concussion on cognitive functioning in retired Australian Rules Footballers: a preliminary report of a 25-year follow-up – Part 1(30)</i></p> <p>Hannah Blaine <i>Long-term impact of concussion on cognitive functioning in retired Australian Rules Footballers: a preliminary report Part 2((30)</i></p> <p>Sarah Banks <i>The Professional Fighters’ Brain Health Study: Initial Cognitive, Behavioral and Neuroimaging Findings</i></p>	<p>Mardee Greenham <i>Predictors of social and behavioural outcomes 12-months post-paediatric arterial ischemic stroke</i></p> <p>Kate Noone <i>Predictors of quality of life in adolescents and young adults with a history of childhood traumatic brain injury</i></p> <p>Nick Ryan <i>Predictors of Longitudinal Outcome and Recovery of Pragmatic Language and its Relation to Externalizing Behavior after Pediatric Traumatic Brain Injury</i></p> <p>Coco Bernard <i>Do concussion symptoms really resolve in young children?</i></p> <p>Janine Cooper <i>Supporting Memory Difficulties in Children and Adolescents: A Virtual Peer Delivered Intervention</i></p>	<p>Jaqueline Rushby <i>Impaired amygdala responsivity to angry facial expressions in severe traumatic brain injury</i></p> <p>Amelia Hicks <i>Behaviours of Concern Following Traumatic Brain Injury</i></p> <p>Kate Gould <i>The Lived Experience of Behaviours of Concern after Traumatic Brain Injury: A Qualitative Study</i></p> <p>Andrew James <i>Exploring the relationships between cognitive executive function and behavioural disorders after brain injury</i></p> <p>Glenn Kelly <i>Treating inappropriate sexual behaviour after acquired brain injury: Community-based behaviour support interventions</i></p> <p>Jill Winegardner <i>Perspectives Group: An innovative approach to treating hostility bias in a brain injury population</i></p>	<p>Lynette Tippett <i>Longitudinal investigation of presymptomatic Huntington’s Disease: Shifting the focus from frontal-striatal circuits to posterior-striatal circuits</i></p> <p>Sophie Andrews <i>How does cognitive task performance relate to subjective ratings of executive dysfunction in Huntington’s disease (HD)?</i></p> <p>Martine Van Zandvoort <i>A case of selective progressive buccofacial apraxia, and the role of motor programming in verbal working memory</i></p> <p>Yanhong Dong <i>Profiles of neuropsychological impairment in ischemic stroke and transient ischaemic attacks</i></p> <p>Breda Cullen <i>Resting state connectivity and cognitive performance in adults with Cerebral Autosomal-Dominant Arteriopathy with Subcortical Infarcts and Leukoencephalopathy (CADASIL)</i></p> <p>Liliann Manning <i>Autobiographical memory and episodic future thinking in multiple sclerosis: neuropsychological rehabilitation and neuroimaging memory</i></p>
12.45 – 1.45	LUNCH in Grand Ballroom Foyer and Brisbane Room brought to you by Shine Lawyers			
12.45 – 1.45	STUDENT “Meet and Greet” Lunch in Canberra Room			
1.00 – 1.40	Brain Impairment Editorial Board Meeting in Perth Room			
1.45 – 3.15	CONCURRENT SESSIONS 5 – 8			
	<p>Session 5: Traumatic Brain Injury Venue: Perth Room Chair: Leanne Togher</p>	<p>Session 6 Errorless learning: From lab to rehab Venue: Sydney Room Chair: Roy Kessels Discussant: Tamara Ownsworth</p>	<p>Session 7: Improving patient outcomes in clinical neuropsychology: taking advantage of evidence-based practice Venue: Melbourne Room Chair: Simon Crowe Discussant: Sue Meares</p>	<p>Session 8: Social-emotional cognition in healthy and pathological populations Venue: Adelaide Room (4th floor) Chair: Olivier Piguet</p>
	<p>Joanne Steel <i>Speech pathology assessment of cognitive communication during post-traumatic amnesia (PTA) and early recovery</i></p> <p>Elise Elbourn <i>Recommendations for strengthening the quality of longitudinal research into communication disorders following TBI</i></p> <p>Adam McKay <i>Agitation during post traumatic amnesia and its association with disorientation and impairments in memory</i></p> <p>Alicia Dymowski <i>A comparison of computerised attention training with individualised strategy training after TBI: A single case series</i></p> <p>Catherine Willmott <i>Predicting educational and vocational outcomes in adolescents and young adults studying prior to injury.</i></p> <p>Gershon Spitz <i>Predicting cost following traumatic brain injury</i></p>	<p>Barbara A. Wilson <i>The past, present and future of errorless learning in memory rehabilitation</i></p> <p>Catherine Haslam <i>A framework for application of errorless learning in children with brain injury: The role of elaborative encoding and Skype delivery</i></p> <p>Luciano Fasotti <i>Outcome prediction of errorless Learning in Goal Management Training after acquired brain-injury</i></p> <p>Roy Kessels <i>Development and evaluation of an errorless learning manual for use in people with dementia</i></p> <p>Discussant: Tamara Ownsworth</p>	<p>Stephen Bowden <i>Resources for the evidence-based Neuropsychologist</i></p> <p>Justin Miller <i>Critically Appraised Topics (CAT) for intervention studies: implementation for the clinician-scientist</i></p> <p>Stephen Bowden <i>Evidence-based neuropsychology in epilepsy: application of CATs to guide clinical decision making</i></p> <p>Gordon Chelune <i>Evidence-based practice: putting research to work in clinical decision making</i></p> <p>Discussant: Sue Meares</p>	<p>Jason Bruggemann <i>Empathy in young people: change in brain function with the manipulation of visual attention to emotional faces</i></p> <p>Jacqueline Rushby <i>Gaining insight into the functional role of the mirror neuron system from traumatic brain injured patients</i></p> <p>Skye McDonald <i>Willing or not? Problems understanding sincerity after severe Traumatic Brain Injury</i></p> <p>Katherine Osborne-Crowley <i>Developing an Observational Measure of Social Disinhibition after Traumatic Brain Injury</i></p> <p>Fiona Kumfor <i>Do I know you? Examining memory for faces in frontotemporal dementia</i></p> <p>Olivier Piguet <i>Neural correlates of emotion and social cognition in frontotemporal dementia</i></p>

3.15 – 3.45	Afternoon Tea in Grand Ballroom Foyer and Brisbane Room
3.45 – 5.15	PLENARY 2 Venue: Grand Ballroom Chair: Michael Kopelman and David Shum
3.45 – 4.30	INS Presidential Address: Prof Ann Watts <i>How International is International Neuropsychology? A Review of Evolving Challenges and Opportunities</i>
4.30 – 5.15	ASSBI Presidential Address: A/Prof Tamara Ownsworth <i>To err is human; to self-regulate after brain injury, divine</i>
6.30	CONFERENCE DINNER Venue: Dockside

THURSDAY ABSTRACTS

Workshop 7

Connecting with others: Writing for Publication: papers, chapters and books

Wilson, Barbara A¹

¹The Oliver Zangwill Centre, Ely, Cambridgeshire, United Kingdom

In this session we shall examine different styles of academic writing for scientific journals, academic chapters and professional books. We consider appropriate audiences and journals for a scientific paper and the right publisher for a book. Some examples of good and bad writing are reviewed. We explore ways of writing a scientific paper, structuring a chapter and planning a book. The structure of a paper is usually in four parts: introduction, methods, results and discussion. We consider what should be covered in each section. Chapters are usually commissioned and a structure may be provided for you in order to correspond with other chapters in the book. Although chapters may not count for so much in citation scores, they can be very creative. We discuss chapters aimed at: 1) teaching, 2) state of the art summaries, and 3) exploration of important topics. Finally, we reflect on writing an academic book. We examine some examples of book proposals and consider books for different purposes. We shall reflect upon the advice of Fowler and Fowler (1906) who recommended that a writer should “be direct, simple, brief, vigorous, and lucid.”

Learning Objectives:

At the end of this workshop, participants will be able to:

1. Select the best audience, journal and publisher for their work
2. Know how to structure a scientific paper
3. Have some insight into the process of publishing a book

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Plenary Session 1

The Frontotemporal Dementias in the context of the genetic revolution

Hodges, John R^{1,2,3}

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²Neuroscience Research Australia,

³UNSW, Sydney, NSW

Frontotemporal Dementias (FTD) is a complex disorder with various presentations and a range of underlying pathologies. The symptomatology of FTD depends on the initial distribution of pathological changes in the brain. Those with orbitomesial frontal changes present changes in social cognition and behaviour (behavioural variant FTD) while those with anterior temporal lobe involvement manifest the syndrome of Semantic Dementia. Others with perisylvian

pathology have Progressive Nonfluent Aphasia. A recently recognised variant is termed Logopenic Progressive Aphasia reflects pathology at the angular gyrus region.

There is also considerable overlap at a clinical and pathological level between FTD and both motor neuron disease and the Parkinsonian disorders.

Up to a quarter of cases are inherited and unlike Alzheimer’s disease, the pathology of FTD is heterogeneous involving a number of protein abnormalities including tau and TDP-43. The last decade has witnessed an explosion of knowledge concerning the pathology and genetics especially since the discovery of the C9orf72 mutation associated with familial FTD and MND but is also found in a proportion of cases with no family history. The later is also associated with a high rate of psychosis. Most FTD cases with c9orf72 mutation present with behavioural changes but progression can be very slow and the presentation cryptic.

Advances in neuropsychology and in brain imaging have facilitated the early diagnosis and differentiation of these disorders. The assessment of patients with potential FTD, and related disorders, depends upon a comprehensive evaluation of behavioural symptoms, cognition and language changes as well as brain imaging and ancillary investigations.

The talk will present an overview of FTD stressing the genesis of symptoms, such as impaired emotion and recognition and theory of mind, and will place this knowledge in the context of the genetics and biology of FTD.

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Stroke Rehabilitation: Translating Neuroscience to Neurorehabilitation

Carey, Leeanne¹

¹Florey Institute of Neuroscience and Mental Health and La Trobe University

A paradigm shift is emerging for stroke rehabilitation. Compelling evidence of neural plastic changes in the brain provides new hope for stroke survivors and challenges rehabilitation clinicians to adopt more restorative approaches to rehabilitation. It opens a window for learning-based recovery and rehabilitation.

By way of example, I will retrace the steps involved in translating knowledge from neuroscience and learning into a novel, evidence-based approach to rehabilitation of body sensations after stroke. The process of operationalizing robust evidence from neuroscience into an effective sensory rehabilitation intervention will be highlighted. Task specific training effects were achieved first, followed by transfer of training effects to novel stimuli. The effectiveness of an optimal clinical training package was then demonstrated in a randomized controlled trial. Insights from our neuroimaging studies of changes in brain activity associated with sensory recovery and rehabilitation will be presented and reviewed in the context of targeting rehabilitation to the individual. Long term implementation into clinical settings will be outlined. Following the lecture attendees will: (1) Recognize that stroke

survivors can expect further gains even months and years after stroke with therapies that activate neural plasticity and (2) Articulate the steps involved in systematically developing novel therapies based on neuroscience.

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Concurrent Session 1 - Concussion in sport: long-term Impact

Paul McCrory – no abstract

Long-term impact of concussional head injury on cognitive functioning in retired Australian Rules Footballers: a preliminary report of a 25-year follow-up – Part 1

Maddocks, David¹; Blaine, Hannah² and Saling, Michael.^{2,3,4}

¹Melbourne Neuropsychology Services, Australia

²Melbourne School of Psychological Sciences, University of Melbourne, Australia

³Department of Neuropsychology Austin Health, Australia

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Background: Neuropsychological research in Australia into the acute effects of concussion in sport commenced around 30 years ago. At that time, the focus was on acute recovery. Studies were conducted on the football codes including Australian Rules Football (ARF).

Method: In the late 1980's and early 1990's, the authors (Maddocks & Saling), conducted a number of studies on elite level ARF players, including: (i) the acute assessment of orientation following injury; (ii) base-line neuropsychological testing with subsequent post-injury testing of concussed players; and (iii) comparison of functional levels of playing performance pre-concussion with those on return to play following injury.

Results: Overall, concussed players made a good recovery in terms of the neuropsychological measures employed and functional indices of playing performance, which reinforced the view that concussive injury could be associated with reversible neuropsychological consequences.

Discussion: In the 1980's and 1990's while research was conducted into the acute effects of sporting concussion and recovery, there was little, if any, interest in possible long-term effects in the football codes. However, more recently, reports of cases of dementia and Chronic Traumatic Encephalopathy (CTE), in some former American National Football League players, as well as litigation, has led to enormous interest both medically and legally, as well as in the media, in possible neurodegenerative changes associated with long-term cognitive and psychological effects of concussion. In Australia, there have recently been reports in the media of former players reporting significant cognitive difficulties. The neuropsychological studies conducted by the authors 25 years ago now provide important data (in terms of demographic information, concussion history and pre and post-concussion neuropsychological performance), upon which the former players involved can now be re-assessed. The following presentation provides a preliminary analysis of a 25 year follow-up of former players.

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Long-term impact of concussional head injury on cognitive functioning in retired Australian Rules Footballers: a preliminary report of a 25-year follow-up – Part 2

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Background and aims: This paper presents a 25-year neuropsychological follow-up of an Australian Rules football (ARF) cohort studied originally by Maddocks and Saling (1996). The primary aim was to assess whether there is a long-term impact of concussional head injury on cognitive function.

Method: In addition to those tests originally administered (Digit Symbol Substitution Test; Paced Auditory Serial Addition Test; Four Choice Reaction Time), the California Verbal Learning Test, Trail Making Test, Controlled Oral Word Association Test, Victoria Stroop Test, and selected self-report functional health and well-being, and quality of life measures were used. Twenty-nine former Victorian Football League/ Australian Football League players, aged from 44-56 years ($M_{age}=48.8$ years), completed both the neuropsychological testing and psychosocial questionnaires.

Results: Concussional history did not have an influence on cognitive or psychosocial functioning in this sample of retired ARF players. There was no evidence of deterioration in cognitive function across time. Irrespective of concussional history, age appeared to be an important contributor to subjective memory complaints, with older participants reporting greater memory concerns.

Conclusions: In this sample of retired ARF players no evidence of objective cognitive change was found over the time period in which CTE is said to evolve. This research shows, for the first time that long-term cognitive and psychosocial outcome in ARF players may be unrelated to career-long concussional history, suggesting that there is no discernible risk of a concussion-related functional impairment.

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The Professional Fighters' Brain Health Study: Initial Cognitive, Behavioral and Neuroimaging Findings

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Background/Objectives: The role of repeated non-severe head injuries on brain health is a topic of heated debate. The PFBHS is an ongoing, longitudinal study of brain health in boxers and mixed martial arts fighters. Both active and retired fighters are studied. The purpose of the PFBHS is to assess the impact of repeated head trauma, both at concussive and subconcussive levels, on brain health as measured by neuroimaging and cognitive assessment.

Methods: Annual visits include collection of demographic and fight exposure data, cognitive assessment, and MRI involving DTI and resting state fMRI. To date nearly 500 fighters are enrolled and approximately 150 have completed at least 2 visits. PET substudies using ligands that bind to amyloid and tau are also starting alongside the main PFBHS.

Results: Results of several investigations will be discussed. We have found relationships between exposure to fighting and both structural and functional aspects of brain health, including thalamic and basal ganglia volume, connectivity and processing speed. We have also found relationships between fighting and cognition to be mediated by level of education. Finally, we will report on the relationship between admitted steroid use and brain health in this population.

Conclusions: The PFBHS contributes to our understanding of the impact of sports related head injury on cognitive health and related neuroimaging findings.

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Concurrent Session 2 - Understanding and supporting optimal psychosocial outcomes following brain injury across childhood and adolescence

Predictors of social and behavioural outcomes 12-months post-paediatric arterial ischemic stroke

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Background and aims: Paediatric arterial ischemic stroke (PAIS) disrupts brain development and emerging neural networks. Little is known about social and behavioural function following PAIS. This paper describes the social and behavioural deficits following PAIS and predictors of outcome.

Method: Thirty-eight children were involved in a prospective, longitudinal study investigating recovery over the 12-months following diagnosis. Children's social functioning was assessed at 6 and 12 months post-PAIS and behaviour at 12 months post-PAIS, using standardised measures. **Results:** Social function was poorer than normative data at both 6 and 12 months post-PAIS. Behavioural problems were higher than expected, with 33% of participants impaired. Social function at 12 months post-PAIS was associated with premorbid social function and parent mental health. Behavioural problems were associated parent mental health, family burden and premorbid social function.

Conclusions: Social and behavioural function are impaired post-PAIS, with deficits associated with premorbid problems, parent mental health and family burden. Identifying early predictors of poor outcomes following PAIS will facilitate early intervention. Of particular importance are family factors, suggesting support for family may improve child outcome.

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Predictors of quality of life in adolescents and young adults with a history of childhood traumatic brain injury

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Background and Objectives: Childhood traumatic brain injury (CTBI) can be a lifelong problem, with sequelae persisting into adolescence and adulthood. Although ongoing deficits have been found to detrimentally affect quality of life (QoL) many years post-injury (Anderson, Brown, & Newitt, 2010), little research has examined long-term QoL outcome following CTBI. As such, the current understanding of QoL many years post-CTBI remains uncertain. Despite the importance of identifying at risk survivors and developing effective intervention to improve QoL, few studies have investigated predictors of QoL in survivors of CTBI. This study aimed to examine QoL across severity groups; investigate predictors of QoL; and explore the utility of a mediation model for predictors of QoL in survivors of CTBI.

Method: This study forms part of the 16-year follow-up of a prospective longitudinal study. The 52 participants (aged 16 to 30 years) were divided according to injury severity – mild (n=15), moderate (n=26) and severe (n=11) – and assessed using questionnaires and neuropsychological/psychiatric protocols.

Results: No QoL differences were found between severity groups. Examination of predictors demonstrated that injury severity did not predict QoL. Socio-economic status predicted

health related-QoL (HR-QoL) when mediated by IQ. IQ directly predicted HR- but not general-QoL and psychological problems predicted both general- and HR-QoL.

Conclusion: The results indicate that injury factors do not pre-determine QoL 16-years post-CTBI, rather environmental, cognitive and psychological factors have greater influence on long-term QoL outcome. This suggests all survivors, regardless of injury severity, should be screened for low QoL. It also emphasises alternative factors which could identify survivors at risk of lower QoL. Moreover, this study proposed modifiable risk factors which, if targeted by interventions, may improve QoL.

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Predictors of Longitudinal Outcome and Recovery of Pragmatic Language and its Relation to Externalizing Behavior after Pediatric Traumatic Brain Injury

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Objectives: The purpose of this prospective longitudinal study was to evaluate the contribution of age-at-insult and brain pathology to variability in outcome and recovery of pragmatic language after pediatric traumatic brain injury.

Method: Participants with TBI ($n = 112$) were categorized according to timing of brain insult: (i) Middle Childhood (5-9 years; $n = 41$); (ii) Late Childhood (10-11 years; $n = 39$); and (iii) Adolescence (12-15 years; $n = 32$) and group-matched for age, gender and socio-economic status (SES) to a typically developing (TD) control group ($n=43$). Participants underwent magnetic resonance imaging (MRI) including a susceptibility weighted imaging (SWI) sequence 2-8 weeks after injury and were assessed on measures of pragmatic language and behavioral functioning at 6- and 24-months after injury.

Results: Children and adolescents with TBI of all severity levels demonstrated impairments in these domains at 6-months post-injury before returning to age-expected levels at 2-years post-TBI. However, while adolescent TBI was associated with post-acute disruption to skills that preceded recovery to age-expected levels by 2-years post injury, the middle childhood TBI group demonstrated impairments at 6-months post- injury that were maintained at 2-year follow up. Reduced pragmatic communication was associated with frontal, temporal and corpus callosum lesions, as well as more frequent externalizing behavior symptoms at 24-months post injury.

Conclusions: Persisting pragmatic language impairments after pediatric TBI are related to younger age at insult, as well as microhemorrhagic pathology in brain regions that contribute to the anatomically distributed social brain network. Relationships between reduced pragmatic communication and more frequent externalizing behavior underscores the need for context-sensitive rehabilitation programs that aim to increase interpersonal effectiveness and reduce risk for maladaptive behavior trajectories into the long-term post injury.

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Do concussion symptoms really resolve in young children?

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Background and aims: Mild Traumatic Brain Injuries (mTBI) or ‘concussions’ are extremely common during childhood, with a significant minority experiencing ongoing difficulties. Traditional diagnostic measures are of limited use in assessing the severity of mTBI; therefore emergency clinicians rely heavily on symptom-based assessment. Despite this, little attention has been devoted to the nature and time-course in symptomatology between preschool and school-aged children, or to the non-acute management of concussion.

Method: Parents of children between the age of 2 and 12, who presented to the Sunshine Hospital Emergency Department, with either a concussion or superficial injury to the head or body (control), were invited to participate. Children were divided into four groups according to age (preschool, primary school) and injury type (concussion, superficial injury). Parents completed a post-concussive symptom checklist at; time of injury, 1 week, 1 month, 2 months and 3 months post-injury.

Results: Contrast analysis of symptom trajectories over time revealed a significant difference ($p < .001$) between the mTBI and control group. Whilst both groups showed a rapid improvement in symptomatology by 1-week post-injury, the mTBI group never showed complete symptom resolution and even showed an increase in behavioural symptoms between 2 and 3 months post-injury ($p = .035$). Variation in symptomatology between preschool and school aged mTBI groups was also evident. Increased irritability and emotionality were commonly reported for both, however, parents of pre-school children reported higher rates of aggressive-type behaviours ($p < .001$) at 3 months.

Conclusions: Behavioural changes were the most persistently reported symptoms over the follow-up period, with some age-related variation in symptom type. Clinicians working in Emergency Departments should be informing parents of these likely outcomes so they feel comfortable approaching community support services when required.

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Supporting Memory Difficulties in Children and Adolescents: A Virtual Peer Delivered Intervention

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Background: A common outcome of childhood acquired brain damage is memory impairment and a problem with recollecting personal memories involving the self, known as autobiographical memory (ABM). In most cases if left undiagnosed or without treatment, the effects can be highly detrimental to an individual’s wellbeing, leading to anxiety, social skill issues and a loss of independence. Currently in Australia, the management and treatment of childhood memory impairment remains a major challenge. In direct response to this, we have developed a computerised intervention designed to offer support for ABM impairment via an interactive virtual reality peer. The aim of the case study was to assess the efficacy of this intervention at improving the subjective well being of the individual.

Method: A seventeen year old adolescent living with ABM impairment completed a 4 week memory support intervention.

Outcome measures included standardised memory and subjective wellbeing assessments that were administered pre and post intervention. Qualitative data on memory ability and subjective wellbeing was also obtained in real time during child and peer interactions.

Results: It is feasible to administer support and therapy for memory problems using a virtual reality peer. The intervention was able to provide greater detail on the memory problems experienced and the effect this has on quality of life than standardised measures. It was able to provide support to the adolescent and self reported improvements were observed in subjective wellbeing (i.e. anxiety, future planning, self evaluation and independence). Quantitative analyses revealed there was an improvement in visual memory.

Conclusions: As no intervention for younger people living with ABM impairment currently exists, we believe the results of this case study could have major personal, social, economic and clinical benefits for patients, their families, educators and health services.

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Concurrent Session 3 – Behaviours of concern following Brain Injury

Impaired amygdala responsivity to angry facial expressions in severe traumatic brain injury

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Background and aims: A large body of research shows that people with severe traumatic brain injury have poor ability to identify emotional expressions in others, with negative emotions being more impaired. In previous research we have shown that people with TBI were differentially impaired in their psychophysiological responses to emotional facial expression. For the current study we explored the neural correlates of these deficits

Method: 24 adults (19 male, age 46.9, SD = 13.7), who had sustained a TBI, and 24 age and gender matched healthy controls participated. Electroencephalography was recorded in an event-related potential (ERP) dishabituation paradigm in which participants viewed repetitions of happy and angry facial expressions, which were occasionally interpolated with an alternative facial expression. Low-resolution electromagnetic tomography (LORETA) was used to examine the neural sources of the face elicited P3 component of the ERP.

Results: LORETA found a number of common sources to both facial expressions. The most substantial (amygdala, insula, cuneus, anterior cingulate, mid-temporal and mid-frontal gyrus) were examined in response to stimulus repetitions. There was an exponential decline for most sources examined to each stimulus type for both groups, however, an increase in activation was found for the amygdala to angry facial expressions in the control group, whereas response decrement was found in the TBI participants to both facial expressions.

Conclusions: In line with or previous research (McDonald, Rushby et al., 2011) people with TBI showed an impaired response pattern to angry facial expressions, suggesting an impairment within the ventral frontal neural system that mediates automatic orientation and responses to emotionally significant stimuli.

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Behaviours of Concern Following Traumatic Brain Injury

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Background and aims: Behaviours of Concern (BoC), such as aggression, are a debilitating and distressing consequence of Traumatic Brain Injury (TBI). This study sought to explore the frequency, severity and factors associated with BoC in clients receiving treatment through the Victorian Transport Accident Commission.

Method: Primary participants were 90 individuals with moderate to extremely severe TBI (mean age at injury = 29.54 years; mean PTA = 64.9 days; mean time post-injury = 11.63 years). Structured telephone interviews examining socio-demographic and injury factors, pre-injury history, support needs, treatments received and changes in behaviour were conducted with the TBI participant, as well as nominated family members/carers and/or clinicians. Informants completed the Overt Behaviour Scale (OBS). Data from client files, e.g. neuropsychological reports and treatment plans, and treatment expenditure data for attendant care and therapy costs were also collected.

Results: 136 interviews were conducted relating to 87 of the 90 participants. 71% were identified as having BoC as measured by the OBS. The most common behaviour problems identified on the OBS were verbal aggression, inappropriate social behaviour, and lack of initiation. 37.2% exhibited three or more BoC, typically at the most severe level. 40% reported receiving treatment for BoC, predominantly from a psychologist or neuropsychologist. There was a significant relationship between BoC and psychology costs ($r = 0.29$, $p = .02$, $n = 63$). For individuals with more severe TBI, as measured by PTA duration, presence of BoC were associated with significantly higher costs of attendant care support.

Conclusions: This study has highlighted that severe behavioural problems, predominately verbal aggression, persist many years following injury. Despite the severity of the BoC, the majority of participants did not receive treatment. Factors associated with these problems and their management will be explored.

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The Lived Experience of Behaviours of Concern after Traumatic Brain Injury: A Qualitative Study

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Background and aims: Behaviours of Concern (BoC), such as aggression, are a debilitating and distressing consequence of Traumatic Brain Injury (TBI). The perspectives of clinicians and family members on BoC have been previously explored, but no qualitative studies have included the perspective of the individual with the TBI. The aim of this study was to explore the lived experience of BoC and treatment history in individuals with TBI, and their family member and/or clinician.

Method: Primary participants were clients of the Victorian Transport Accident Commission (TAC), who had sustained a TBI and were identified as having BoC based on TAC records and a telephone survey. Semi-structured qualitative interviews were conducted with 14 participants (5 TBI individuals, 5 family or care workers, and 4 clinicians), which were coded and analysed using an iterative process. Rigour was ensured through multiple methods.

Results: Participants with TBI and their informants described frequent BoC including physical and verbal aggression. Impact of BoC on relationships and employment were

highlighted, leading to a loss of sense of self, isolation and further frustration. Reduced insight and rigid thinking were barriers to intervention according to clinicians. Themes related to interventions for BoC included poor treatment knowledge, the importance of involving family, and the establishment of a sense of purpose and self-esteem through meaningful participation.

Conclusions: These findings provide clear direction for the necessary components of a multi-faceted, individualised treatment model to minimise the impact of BoC, and maximise the quality of life in individuals with TBI and their families.

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Exploring the relationships between executive function and behavioural disorders after brain injury

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Background and aims: Aggression and inappropriate sexual behaviour (ISB) occur relatively frequently following severe acquired brain injury (ABI) and pose a significant challenge to rehabilitation efforts. Understanding the mechanisms of these problematic behaviours is key to developing better management and intervention strategies. The aim of the present study was to explore the relationships between executive function and these behaviours.

Method: The BIRT Aggression Rating Scale (BARS) and the St Andrew's Sexual Behaviour Assessment (SASBA) were used to record behaviours exhibited by a sample of 86 participants engaging in residential neurobehavioural rehabilitation. All had well-documented severe ABI of varying aetiology. Cognitive executive skills were measured with selected subtests from the Delis-Kaplan Executive Function System (D-KEFS). The six factors of the WAIS-III and WMS-III (considered core non-executive cognitive processes) were used as covariates in serial logistic regression models.

Results: The prevalence of verbal aggression, physical aggression and ISB was 50%, 26% and 22%, respectively. Making more errors on the D-KEFS Tower Test predicted the presence of verbal aggression (not physical aggression) and was a particularly strong predictor of ISB. No other measure of reduced executive performance was predictive. However, contrary to expectation, the presence of all three behaviours was predicted by better performances on the letter fluency condition of the D-KEFS Verbal Fluency Test.

Conclusions: ISB, and to some extent, verbal aggression, may partially arise following ABI from an inability to inhibit explicit "rules" of social behaviour that override impulses. It is also speculated that poor performance on letter fluency may reflect reduced behavioural drive or initiation following brain injury, which may negate the development of these behaviours.

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Treating inappropriate sexual behaviour after acquired brain injury: Community-based behaviour support interventions

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Background and objectives: Inappropriate sexual behaviours (ISB) are a challenging clinical sequelae of acquired brain injury (ABI). Limited evidence exists about treatment approaches, with only a handful of case studies published to date. This study reports an exploratory clinical trial of community-based behaviour support interventions (BSIs) as a treatment approach to ISB after ABI using a longitudinal design.

Method: From routine referrals to a statewide service specialising in the treatment of challenging behaviours after ABI, a subset (n=24) displaying ISBs were selected. The BSIs were multifocal, and used a variety of approaches including environmental change, psychoeducation, and specific behavioural techniques. These approaches targeted the person with ABI, support personnel, and other environmental domains. Behaviour data were collected using the Overt Behaviour Scale (OBS) at baseline, discharge and follow-up. Multilevel models were used to analyse the data.

Results: There was a significant decline in ISBs from baseline to discharge that was maintained at follow-up. Specificity of the intervention was demonstrated by comparison with concurrent challenging behaviours displayed by participants (aggression, perseveration, absconding), which showed no significant change over the same time points.

Conclusion: The results demonstrate the potential efficacy of community-based BSIs in treating ISBs after ABI.

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Perspectives Group: An innovative approach to treating hostility bias in a brain injury population

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Background: Emotion dysregulation manifested by increased aggression is a common consequence of acquired brain injury and has a powerful impact on survivors and their families. For some, an underlying hostility bias, which is the tendency to assume negative motives in others in ambiguous situations, increases the number of situations likely to provoke an angry response.

Method: We ran a six-week Perspectives Group one hour per week with two adult male clients, both many years post-ABI, who experienced severe interpersonal dysfunction as a result of their hostility bias and difficulty managing strong emotions. We used a single subject multiple baseline design. Measures were taken at three time points: initial assessment, prior to intervention, and post-intervention. Primary measures were the Buss and Perry Aggression Questionnaire (BPAQ) and the Interpersonal Reactivity Index (IRI) (measure of empathy). Subjects also completed mood and communication measures and participated in a semi-structured qualitative interview with their partners.

Results: Both subjects showed remarkable reduction in BPAQ scores and little change on the IRI. Qualitative interviews supported questionnaire measures suggesting both subjects reduced their aggressive behaviours and increased their perspective-taking. We interpret these results to suggest that both subjects became able to cognitively evaluate circumstances as possibly being non-hostile (a new perspective) and therefore adapted their responses accordingly, without changing their level of emotional reactivity.

Conclusions: A novel intervention addressing hostility bias via perspective-taking was extremely useful in reducing anger behaviour. We suggest that cognitive re-appraisal led to fewer situations being assessed as worthy of anger.

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Concurrent Session 4 – Cognitive function in degenerative and vascular disease

Longitudinal investigation of presymptomatic Huntington's Disease: Shifting the focus from frontal-striatal circuits to posterior-striatal circuits

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Background and aims: The conventional view of Huntington's disease (HD) as a disease of the basal ganglia primarily affecting frontal-striatal circuits has been challenged by some neuropathological and neuroimaging studies that suggest posterior cortical changes predate changes in anterior cortex. The aims of this study were to investigate whether there were (i) posterior cortical changes in a group of pre-symptomatic HD individuals; (ii) neuropsychological changes in functions related to these regions.

Method: We conducted a longitudinal study of 18 individuals presymptomatic for HD and 17 closely-matched controls, using neuroimaging methods and neuropsychological measures that targeted cognitive functions likely to be disrupted by dysfunction of posterior cortical regions.

Results: Volumetric analyses (VBM) revealed grey-matter changes in posterior cortical regions. Neuropsychological findings revealed significant decline on a posterior task involving egocentric rotation, most pronounced for individuals close to clinical onset. In contrast, there were no structural changes in anterior cortex and neuropsychological performance was unremarkable on tasks sensitive to anterior regions. Expected volume reductions of the striatum were found, while diffusion tensor imaging also revealed white-matter changes in striatal-occipital connections. Putamen volumes at both time-points significantly predicted performance on the egocentric rotation task.

Conclusions: These findings suggest that changes in posterior cortex, possibly linked to dysfunction of posterior-striatal circuitry may precede fronto-striatal decline in preHD. The search for sensitive and reliable clinical and neuroimaging biomarkers capable of tracking proximity to symptom onset in presymptomatic HD, may benefit from a shift in focus from frontal-striatal circuits and functions to posterior-striatal circuits and functions.

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How does cognitive task performance relate to subjective ratings of executive dysfunction in Huntington's disease (HD)?

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Background and aims: In HD, executive dysfunction can be measured both by performance on cognitive tasks, as well as self and other reports of behaviour. It is not clear, however, whether behavioural rating scales and cognitive tasks both measure the same construct. The current project examined self- and companion-reported executive dysfunction in pre-

symptomatic and symptomatic-HD, and their relationship with cognitive task performance.

Method: 62 pre-HD and 80 HD participants from the Track-HD study, all of whom had companions who provided additional ratings, were included in the study. 119 healthy controls from Track-HD served as a comparison group.

Participants and companions completed the Frontal Systems Behavior scale (FrSBe), as well as a battery of cognitive tasks. The HD group was significantly older than pre-HD group.

Results: After controlling for age, HD participants rated themselves as having significantly more executive dysfunction than either pre-HD or controls, with pre-HD having intermediate levels of self-rated dysfunction. Companions rated HD participants as significantly more dysexecutive than pre-HD participants. Patient- and companion-ratings of executive dysfunction were moderately correlated. In HD, both higher self-ratings and companion ratings were moderately correlated with measures of speed and higher-level attention, whereas in pre-HD only self-ratings correlated with these tasks.

Conclusions: Dysexecutive behaviour appears to be more common in HD with disease progression. Participants with early HD, as a group, have sufficient insight to be able to report these symptoms. Overall, dysexecutive behaviour as measured by self-report was related to performance on measures of speed and attention, suggesting that these behavioural ratings and cognitive tests may be tapping the same construct. Therefore, behavioural ratings of dysexecutive behaviour are useful tools for clinicians when identifying these symptoms in individuals with early HD.

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A case of selective progressive buccofacial apraxia, and the role of motor programming in verbal working memory

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Background and aims: The syndrome of primary progressive aphasia (Mesulam, 1982) or fronto-temporal dementia (Hodges, et al., 1992) concerns a degenerative illness that may present at onset with a number of different symptoms. Although verbal dysfluencies are often observed, only a few cases have been described in which dysarthria as a result of buccofacial apraxia is the sole symptom (Broussolle, et al., 1996; Kertesz et al., 2003; Roth et al., 2006).

In 2011, a 60-year-old female was referred to us, who complained about deteriorating speech. It became apparent that she suffered from a very selective buccofacial apraxia. We followed the progression of the disease over a five-year period looking at the deterioration of praxic abilities, comorbidity, and the secondary effects of severe dysarthria. **Method:** In December 2011, December 2012, and January 2015, she was seen at the neuropsychology service of the University Medical Centre in Utrecht for a comprehensive neuropsychological assessment. This involved an extensive interview with the patient and with her partner, and additional experimental tasks to test our hypothesis with respect to the fluency of severe dysarthria on the process of reading. Due to her increasing speech impairment a number of these tasks dependent on spoken language reponses, could not be administered in 2012 and 2015.

Results: Her performance on the neuropsychological examination deteriorated, but very selective for the buccofacial apraxia. She demonstrated increasing problems in repeating speech sounds, syllables, single words (Dutch and in a known foreign language), compound words, and sentences.

In 2015, when testing had become difficult, her language comprehension, memory, knowledge of the world, and attention remained intact.

Interestingly, from the first assessment on she mentioned problems in reading. In 2011 she could no longer keep up with the subtitles. In addition, testing showed a growing deficit in verbal working-memory performance (forward: 4; backward: 2) as compared to normal scores on the corsi-span. On an experimental rhyme recognition task she demonstrated difficulties in line with our hypothesis of the influence of dyslexia on internal speech.

Conclusions: The neuropsychological evaluations demonstrated a remarkable progressive but nevertheless selective apraxia, apart from mild executive problems that became apparent during the last assessment. This latter finding supports the diagnosis of a frontotemporal dementia. The pattern of impaired and spared abilities in the language domain is reminiscent of dyslexia. As she had been a normal reader, we need to consider the possibility that her reading deficit resulted from her buccofacial apraxia. This leads us to the intriguing hypothesis that a deficit in the motor programming of speech movements may also affect inner speech in the articulatory loop of working memory, which in turn impedes the reading process. This hypothesis was supported in the rhyme experiment. We suggest an explanation in line with the phonological awareness hypothesis of dyslexia.

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Profiles of neuropsychological impairment in ischemic stroke and transient ischaemic attacks

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Background and aims: Although post-stroke cognitive impairment is prevalent and of prognostic importance, few large-scale studies have profiled neuropsychological patterns of ischemic stroke/transient ischemic attack (TIA) and its etiological subtypes and examined factors accounting for cognitive performance, especially in an Asian cohort. We compared the global and specific cognitive domain

performance of 326 consecutive non-aphasic ischemic stroke/TIA patients at 3–6 months after the vascular event to 383 community-dwelling older adult participants (≥ 60 years old) with no history of stroke/TIA and no cognitive impairment, and also examined cognitive performance and its determinants by stroke aetiological subtypes.

Method: Cognitive performance was measured by a formal neuropsychological battery. Multivariate analysis of covariance with age, sex, education and ethnicity as covariates were employed to contrast the two groups and the stroke subtypes. Regression analyses were used to examine differences in cognitive performance between two stroke subtypes, i.e., patients with large-artery atherosclerosis (LAA) and small-artery occlusion (lacune) (SAO).

Results: Stroke/TIA patients performed worse than controls in global cognition and all cognitive domains except verbal memory, after correction for multiple comparisons. Patients with LAA, cardioembolism (CE), SAO and TIA performed worse than stroke-free controls in global cognition, language, visual memory, visuoconstruction, visuomotor speed and executive function after correction for multiple comparisons ($P < 0.0016$). The combination of cortical infarct, right sided lesions, stroke severity, and anterior circulation infarct accounted for much of the performance difference between LAA and SAO, ranging from 57.1% for verbal memory and 93.3% for global cognition.

Conclusions: Profiles of neuropsychological impairment in ischemic stroke/TIA are characterized by poorer performance in global cognition and all domains except verbal memory. The cognitive performance of patients with the stroke aetiology of LAA, CE and SAO, and patients with TIA performed worse than stroke-free controls. Visuomotor speed is a good cognitive marker in differentiating different severity of CVD lesions. The poorer performance of patients with LAA in global cognition relative to SAO can be largely accounted for by cortical infarct, right sided infarct, NIHSS, and anterior circulation infarct.

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Resting state connectivity and cognitive performance in adults with Cerebral Autosomal-Dominant Arteriopathy with Subcortical Infarcts and Leukoencephalopathy (CADASIL)

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Background and aims: Cognitive deterioration is common in CADASIL, affecting executive function, attention and processing speed from an early stage. Impairment is associated with structural markers such as lacunar infarcts, but associations with functional connectivity have not yet been reported. We investigated cognitive performance and connectivity using resting state functional MRI (fMRI).

Method: Patients with CADASIL underwent fMRI at rest. Intrinsic networks identified via group independent components analysis were compared with networks previously reported in healthy adults, in order to identify four attentional/executive networks of interest. Cognitive assessment focused on domains commonly affected in CADASIL, from which four indices were derived *a priori* for analysis: processing speed; attention & working memory; overall executive function; and Trailmaking B minus A time

(TMTB-A). Region of interest (ROI) correlations were performed between mean intra-component connectivity z-scores and cognitive scores. Voxel-wise correlations were performed using the component spatial maps.

Results: 22 patients took part (11 male; aged 49.8 ± 11.2 years). Two frontoparietal components were found to be associated with cognitive performance. ROI analyses showed that mean connectivity correlated with faster processing speed and TMTB-A, and better executive performance ($r = 0.45$ to 0.77). Voxel-wise analyses showed associations between clusters within the attention network and both faster processing speed (left middle temporal gyrus; peak -48, -18, -14; $Z_E = 5.65$, $p_{FWECorr} = 0.001$) and TMTB-A (right inferior parietal lobule; peak 56, -42, 24; $Z_E = 4.95$, $p_{FWECorr} = 0.04$).

Conclusions: Associations between cognitive performance and attentional network connectivity in this CADASIL group were consistent with previous studies in clinical and non-clinical samples. Functional connectivity may be a useful biomarker of cognitive outcome in this population.

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Autobiographical memory and episodic future thinking in multiple sclerosis: neuropsychological rehabilitation and neuroimaging

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Background and Objectives: To probe the efficacy of a mental visual imagery (MVI)-based facilitation program on impaired autobiographical memory (AM) and episodic future thought (EFT), by testing both clinical and cerebral network changes in pre/post-facilitation.

Method: Impaired AM/EFT MS patients were randomly assigned in three groups: (a) experimental (EG; $n = 10$) followed the MVI program, (b) placebo (PG; $n = 10$): sham verbal program and (c) stability group ($n = 13$). The EG and PG completed two fMRI sessions within a pre-/post-facilitation study design.

Results: In post-facilitation, only the EG showed AM/EFT scores significantly improved. AM condition: functional changes in the medial and lateral prefrontal regions. EFT condition: functional changes in the parahippocampal gyrus, lateral temporal, frontopolar and posterior brain regions.

Conclusions: MVI-based program led to AM/EFT improvement not due to nursing or test learning effects. Brain regions sustaining self-referential processes were observed to be increased with distinct patterns for AM and EFT conditions. While brain regions reflecting an effortful research process for AM decrease, those sustaining contextual processing, visual imagery, personal semantics, integration and maintenance of multimodal information for EFT, increased.

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Concurrent Session 5 – Traumatic Brain Injury

Speech pathology assessment of cognitive communication during post-traumatic amnesia (PTA) and early recovery
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Background and aims: Post-traumatic amnesia (PTA) is a transient stage in recovery after traumatic brain injury (TBI). Communication during PTA may be disordered due to disruption of cognitive and behavioural functions, but there may also be early evidence of persisting cognitive communication (CC) impairment. The presentation and recovery course of CC impairments during PTA and in the months after emergence have not previously been systematically measured and described from a speech pathology perspective. The current research aimed to explore the potential means and utility of speech pathology assessment of CC in the early stages of recovery.

Method: The research used a mixed-methods case study design. Six descriptive, longitudinal case studies were conducted; with repeated assessment of 5 patients' communication while they were in PTA, and one participant at PTA emergence, with follow-up three months after PTA emergence. Assessment included use of discourse analysis, CC assessment tasks, and social communication ratings. Descriptive statistics were used to report on individual participants' performance on test measures, and analysis of group results was also conducted.

Results: Main findings included: (1) it was possible to delineate an individual profile of CC impairment during PTA that remained at follow up, but with greater severity of impairment while the person was in PTA; (2) in addition to this ongoing profile, there was confused language evident during PTA (e.g. confabulation, marked perseveration) that had resolved at follow up and therefore appeared related to being in PTA; (3) recovery of CC ability took place in a continuous way, and improvement on communication measures did not correspond directly to measures of orientation and memory on the Westmead PTA Scale; and (4) all participants demonstrated cognitive and social communication impairment over the course of early recovery from TBI.

Conclusions: It was feasible and informative to assess CC during PTA and early recovery, using a combination of qualitative and quantitative assessment methods. The current research contributes to the limited speech pathology literature on early assessment of CC after TBI. Findings have implications for timing and methods of speech pathology assessment during PTA and early recovery.

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Recommendations for strengthening the quality of longitudinal research into communication disorders following TBI

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Background and aims: Longitudinal and prognostic data can inform service planning and delivery for adults with communication disorders. There is currently no synthesised evidence evaluating recovery and prognosis of cognitive-communication abilities following severe Traumatic Brain Injury (TBI). The key aims of this study were to firstly; systematically analyse existing longitudinal research relating to communication disorders post-TBI to; i) Determine the timing, rate and cessation of recovery and ii) Identify the relationship of prognostic factors to the recovery process.

Secondly, this study aims to provide recommendations for future longitudinal and prognostic research into communication disorders following TBI by evaluating study designs, participant characteristics, terminology and measures currently used.

Method: Thirteen health literature databases were accessed up until July 2014. Articles were screened systematically against predetermined inclusion and exclusion criteria. Quality reviews were performed on the selected articles using a modified Downs & Black (1998) Rating Scale. Articles were further analysed for consistency of terminology, inclusion of all levels of the ICF and consistency of reporting participant characteristics. Independent checks were performed on the search and ratings.

Results: A total of 16, 446 articles were extracted and 16 articles met the full inclusion and exclusion criteria for this review. In terms of i) recovery; two studies reported persisting impairments up to 2.5 years post-injury, while another three studies found evidence of recovery up to 2.5 years post-injury. Persisting impairments were those related to conversational abilities and emotional recognition while improvement was related to general language and story telling ability. No studies however, evaluated recovery beyond three years post-injury. With regard to ii) prognosis; the review showed that injury severity, lesion location, brain volume loss and level of conversational skill may predict specific cognitive-communication outcomes. When comparing study characteristics, high variability was evident in study terminology and reporting. Many of the studies did not include key aspects of longitudinal design, for example, reporting on loss to follow-up.

Conclusions: In the first few years after a TBI, improvement may be expected with regard to general language and storytelling abilities, yet persisting impairments with conversational abilities and emotion recognition can be expected. Predictive factors underlying the recovery process remain largely unknown. Building a sound and rigorous evidence base with regard to recovery and prognosis of cognitive-communication disorders after TBI is essential. This study provides recommendations for the design and reporting of future longitudinal and prognostic studies in this research area.

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Agitation during post traumatic amnesia and its association with disorientation and impairments in memory

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Background and objectives: Agitation is considered a common feature of post traumatic amnesia (PTA) after TBI, however, reported frequencies range from 7-70%. Few studies have prospectively examined agitation during PTA using a standardised measure, or examined the course of agitation during PTA and its relationship to the coinciding cognitive impairments. The aims of this study were to: 1) examine the frequency and nature of agitation during PTA using daily prospective measurement; and 2) examine the relationship between agitation levels and the cognitive impairments (orientation and memory) during PTA.

Method: Daily assessments of agitation (Agitated Behavior Scale, ABS) and orientation/memory (Westmead PTA Scale) were conducted in 23 patients during the PTA phase after severe TBI.

Results: Based on commonly used criteria (ABS score >21 for 2 or more consecutive days), agitation was present in 22% of patients. Distractibility (78.3% of patients) and impulsivity (73.9%) were the most common forms of agitated behavior, while violence was relatively rare (8.7%). A mixed effects regression model found that a quadratic relationship best explained the association between agitation and severity of cognitive impairment such that agitation initially increased as orientation and memory function was improving, but reached a peak and then declined as PTA emergence drew nearer.

Conclusions: Agitated behaviour was relatively common during PTA and most commonly involved behavioural manifestations of cognitive impairment rather than aggression and violence. Agitation levels were related to the degree of orientation and memory impairment suggesting that management to improve cognitive function during PTA may help to manage agitation.

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A comparison of computerised attention training and individualised strategy training after traumatic brain injury: a single-case series.

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Background and objectives: Deficits in attention are common following traumatic brain injury (TBI) and can interfere with daily functioning. This study aimed to compare effects of computerised training using Attention Process Training 3 (APT-3) with individualised strategy training on attention, and to examine participants' subjective experience of these approaches, using single case experimental design.

Method: The ABCA (baseline, APT-3, strategy training, follow-up) design was repeated across 3 participants with severe TBI who were ≥1 year post-injury. APT-3 and strategy training (such as Time Pressure Management and environmental modification) comprised 9 1-hour sessions. Alternate versions of the oral Symbol Digit Modalities Test (SDMT) and Ruff 2 and 7 Selective Attention Test (2&7) were administered 9 times per phase by blinded researchers. Generalisation was assessed with the Test of Everyday Attention (TEA) and self and significant other (SO) ratings on the Rating Scale of Attentional Behaviour (RSAB) after each phase. Semi-structured interviews assessed participant experiences of interventions.

Results: Planned Tau-U analyses revealed improvements in automatic cognitive processing on the SDMT and 2&7 automatic condition after APT-3 and follow-up, but more so after strategy training. There was limited generalisation on TEA subtests or self-RSAB ratings. SO-RSAB ratings were mixed after APT-3, but demonstrated definite improvement after strategy training. At final interview, two participants indicated preference to continue with strategy training over APT-3.

Conclusions: Considerable variability in attention deficits and everyday attentional requirements between patients necessitated individualised goals and approaches to rehabilitation, and incorporation of additional strategies for memory and executive difficulties. This study exemplifies the need for individualised rehabilitation of attention to improve everyday functioning following TBI.

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Predicting educational and vocational outcomes in adolescents and young adults studying prior to TBI

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Background and objectives: Although many studies have identified factors associated with successful return to employment following traumatic brain injury (TBI), there have been few investigations of variables associated with educational and vocational outcomes in those studying at a secondary or tertiary level prior to injury. This prospective longitudinal study aimed to identify rates and predictors (pre-injury and injury related) of productivity outcomes at 1 year post-injury.

Method: 145 secondary (45.2%) or tertiary (54.8%) students pre-injury participated. Mean age at injury = 18.6 years ($SD=3.29$) and mean duration of post-traumatic amnesia (PTA) = 21.9 days ($SD=27.18$). *Pre-injury demographic* (gender, age, level of study, living situation), *injury related* (severity, physical injuries), and concurrent *post-injury* (independence in ADLs and self-reported cognitive, behavioural, emotional sequelae) predictors were entered into logistic regressions.

Results: 79.3% of participants were categorised as 'productive'. Of those, 60% were studying, with 40% employed. Participants with longer PTA, as measured objectively by the Westmead PTA Scale, and those with reduced initiative and self-centeredness were less likely to be 'productive'. The overall relationship between PTA and productivity appeared to be largely linear in nature, with PTA duration of more than 80 days substantially reducing the probability of being productive at 1 year.

Conclusions: Overall, PTA duration, and behavioural sequelae, were the strongest predictors of productivity in those studying pre-injury. Rehabilitation should be targeted towards reducing the impact of, and compensating for, barriers such as reduced initiative in order to maximise productive outcomes in this group.

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Predicting cost of care following traumatic brain injury

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Background and aims: The ability to predict costs following a traumatic brain injury (TBI) would assist in planning treatment and support services by healthcare providers, insurers and other agencies. The objective of the current study was to develop predictive models of hospital, medical, paramedical, and long-term care (LTC) costs for the first 10 years following a TBI.

Method: The sample comprised 798 participants with TBI, the majority of whom were male and aged between 15 and 34 at time of injury. Costing information was obtained for hospital, medical, paramedical, and LTC costs up to 10 years postinjury. Demographic and injury-severity variables were collected at the time of admission to the rehabilitation hospital.

Results: Duration of PTA was the most important single predictor for each cost type. The final models predicted 44% of hospital costs, 26% of medical costs, 23% of paramedical costs, and 34% of LTC costs. Greater costs were incurred, depending on cost type, for individuals with longer PTA duration, obtaining a limb or chest injury, a lower GCS score, older age at injury, not being married or defacto prior to injury, living in metropolitan areas, and those reporting pre-morbid excessive or problem alcohol use.

Conclusions: This study has provided a comprehensive analysis of factors predicting various types of costs following TBI, with the combination of injury-related and demographic variables predicting 23-44% of costs. PTA duration was the strongest predictor across all cost categories. These factors may be used for the planning and case management of individuals following TBI.

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Concurrent Session 6 - Errorless learning: From lab to rehab

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Symposium description: More than 20 years ago, Wilson and Badddeley's seminal paper on errorless learning as a principle to teach amnesic patients new materials was published. Since, errorless learning has been applied in a variety of patient groups with memory deficits, using a wide range of to be learned tasks and materials. However, only recently larger clinical trials on the efficacy of errorless learning have been published and studies on its implementation in clinical practice are being performed. In addition, errorless learning is increasingly being combined with other rehabilitation methods, such as e-health or strategy training in patients with impairments in non-memory domains. This symposium will present the current evidence for errorless learning in the clinical rehabilitation of brain injured children and adults, as well as older people with dementia. The first paper is an historic overview of the principle of errorless learning, originating from animal studies an later applied in memory rehabilitation in man. The second paper will focus on examiner- and self-generation errorless learning in children with acquired brain injury compared to trial-and-error learning. In the third paper, trial results on the added value of errorless learning in Goal Management Training of patients with executive deficits due to acquired brain injury will be presented, also focusing on outcome prediction. The next paper focuses on results of an implementation study on errorless learning in dementia and the development of a manual for use in clinical practice. The symposium will close with the discussant's perspective.

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The past, present and future of errorless learning in memory rehabilitation

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Background and Aims: Errorless learning (EL) is a teaching technique whereby people are prevented, as far as possible, from making mistakes while they are learning a new skill or new information. I look at the history of EL which developed from two theoretical backgrounds namely errorless discrimination learning from behavioural psychology and implicit memory from cognitive psychology.

Method: I look at early work with animals and describe how the principle of EL was taken up in the teaching of learning disabled children. I then consider how EL has been adopted in the field of memory rehabilitation. The first papers demonstrating the value of EL for people with severe memory deficits were published in 1994. Since then, EL has become one of the guiding principles in helping memory impaired people to learn new information. Studies illustrating the ways EL is currently used are described and evidence for effectiveness of EL is presented.

Results: EL can be carried out in a number of ways such as providing spoken or written instructions or guiding the person through a task. The principle is to avoid mistakes being made during learning and to minimise the possibility of erroneous responses.

Conclusions: In order to benefit from our mistakes (trial-and-error learning), we need to be able to remember them. People with very poor memory functioning cannot do this. Any mistakes made may be strengthened. I conclude with a discussion of the future of EL.

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A framework for application of errorless learning in children with brain injury: The role of elaborative encoding and Skype delivery

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Background and aims: Errorless learning (EL) has proved effective in adult and older adult rehabilitation, but evidence of its efficacy in children is lacking and largely reliant on a single study recommending it should not be used. The present paper presents data from two studies investigating of EL in young people with acquired brain injury (ABI); focusing on the role of elaborative encoding through self-generation and an alternate form of delivery through Skype.

Method: 15 and 16 children were recruited into Studies 1 and 2 (S1, S2), respectively, with an additional 15 non-injured children in S1 matched for gender and age. In both studies participants studied novel information under EL conditions — comprising standard examiner-generation and self-generation methods — and trial-and-error conditions. However, in S1, the materials comprised word lists presented in face-to-face sessions with the examiner, and in S2, novel age appropriate science and social science facts presented via Skype. Memory was then tested up to 20 minutes (S1) and 24 hours (S2) later.

Results: Findings from both studies indicated that significantly more information was remembered under EL, than trial-and-error, conditions; though only S2 provided evidence of superior performance with the more elaborative encoding afforded by self-generation. Additionally, results of S2 showed that self-generation was effective in overcoming the detrimental effect that reduced attentional capacity had on memory performance.

Conclusions: These studies provide the first demonstration of the efficacy of EL in children but also the basis of a framework to guide its implementation in rehabilitation.

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Outcome prediction of errorless Learning in Goal Management Training after acquired brain-injury

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Background and aims: Patients with acquired brain-injury often experience executive deficits. An intervention that deals with these problems is Goal Management Training (GMT). Traditionally, GMT is administered in a trial-and-error way, in which patients are allowed to make errors during the learning stage. Using a randomized controlled trial we examined whether brain-injured patients with planning problems learn complex daily tasks more effectively when they are given Goal Management Training in an errorless way compared to traditional GMT.

Method: To answer this question 67 patients with executive impairments due to an acquired brain injury were randomly allocated to an experimental GMT - Errorless Learning or to a GMT -Conventional Learning group. Each patient could choose 2 multistep everyday tasks that they wished to learn. Task performance was measured before and after training. Also, Goal Attainment Scaling was used to quantify to what extent patient and trainers thought to have achieved the treatment goals. In addition, potential outcome moderators and mediators were examined.

Results: The results of the study show that the application of errorless learning in GMT improves the execution of everyday tasks compared to conventional GMT. Age and IQ acted as moderators, and executive function as mediator of this beneficial effect.

Conclusion: A combination of errorless learning and GMT is effective in patients with executive deficits, especially in younger patients and those with higher estimated IQs. Older patients responded better to conventional GMT. These findings are highly relevant for the implementation of errorless GMT in clinical practice

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Development and evaluation errorless learning manual for use in people with dementia

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Background and aims: Various studies have shown the efficacy of Errorless Learning (EL) in teaching patients with dementia a large variety of skills and everyday tasks, which may potentially result in a higher degree of autonomy. However, to date no clinical manual or guidelines are available.

Method: we performed a survey study in various health-care institutions to explore the interest in and feasibility of EL in dementia care. Based on this survey, an EL manual was developed, also using available evidence on EL. Secondly, a Delphi round was performed to evaluate this EL manual.

Results: Professionals reported EL to be meaningful and feasible for use in dementia care within their institutions. They also judged the working instructions to be clear and applicable, and they would recommend the EL manual to other health-care disciplines working in dementia.

Conclusions: This study explored the need and feasibility of EL in dementia care, resulting in the first clinical manual on EL that is developed based on information obtained from professionals working in dementia care. Future studies should examine the effectiveness of this manual, and determine the

optimal outcome measures and quality indicators for evaluating this implementation.

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Discussant

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Concurrent Session 7 – Improving patient outcomes in clinical neuropsychology: taking advantage of evidence-based practice

Sue Meares – Discussant

Resources for the evidence-based Neuropsychologist

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Background and Objectives: Evidence-based practice is a term with ‘surplus meaning.’ That is, the term is used in so many ways, that it has unclear meaning to many practitioners. However, in its best use, the term applies to a very clear set of techniques designed to (i) assist clinicians to identify quality research, and (ii) improve patient outcomes.

Method: This presentation surveys some of the key techniques in evidence-based practice that are, for the most part, supported by online learning opportunities and online information resources.

Results: Key resources are illustrated, in particular resources designed to facilitate ‘critical appraisal’ skills. These resources, readily available on diverse websites, support the scrutiny of published evidence to determine the value of, for example, a diagnostic test, or a new treatment. It will be shown, that although these resources are best known in the practice of clinical medicine, the techniques draw on the same principles of criterion-related (construct) validity that have been taught to psychologists for decades.

Conclusions: The methods of critical appraisal, formalized in the clinical decision aid known as Critically Appraised Topics (CATs), provide methods to enhance life-long learning for Neuropsychologists. Because CATs also provide methods to identify the quality of published research and to determine the practical impact of assessment methods or clinical interventions, every Neuropsychologist should be encouraged to become friendly with CATs.

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Critically Appraised Topics (CAT) for intervention studies: implementation for the clinician-scientist

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Background and Objectives: “Evidence-based practice (EBP)” is the standard of care in medicine and now impacts clinical neuropsychology. Evidence-based neuropsychology is a value-driven approach to clinical practice that utilizes “best research” findings to inform clinical decisions about patients in the context of patient values and preferences. While conceptually straightforward, developing standards for clinical applications and disseminating guidance to clinicians requires acquisition of new clinical-thinking skills.

Method: A critically appraised topic (CAT) is a systematic method of evaluating empirical research findings that facilitates integration of published knowledge into patient care with the primary goal of improving clinical outcomes. This presentation will provide an overview of the CAT method with particular attention to evaluating intervention trials using cognitive training as an example applied to a hypothetical

patient. Each step of a CAT, including formulation of a clearly focused clinical question, identification of evidence, determination of experimental validity, extraction of necessary information, calculation of simple relevant statistics and application to an individual patient will be reviewed.

Results: Upon conclusion of the proposed presentation, attendees will be able to independently complete a CAT for an intervention study, including formulation of an appropriate clinical question, calculation of relevant event rates, numbers needed to treat, and relative risk, and integration of these data into practice to inform clinical decision making for an individual patient.

Conclusions: Clinical practice from an evidence-based perspective requires an applied methodology to integrate empirical evidence with clinical expertise and the patient's individual values. CATs are a critical component of effective EBP that ultimately serve to improve patient outcomes.

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Evidence-Based Neuropsychology in Epilepsy: Application of CATs to guide clinical decision making

Stephen Bowden will give this presentation
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Background and Objectives: Over 50 years of research have established neuropsychological examination as a critical element in the care of patients with epilepsy, and provide a foundation for establishing practice parameters.

Method: This presentation will present two Critically Appraised Topic (CAT) completed to (1) assess neuropsychological deficits that lateralize in temporal lobe epilepsy and (2) predict neuropsychological outcome from surgery.

Results: the CAT found multiple Level III and limited Level II data to base evidence-based clinical decision making. An overview of domains to be assessed and foundation for interpretation and prediction of outcomes will be reviewed. Specific selection of assessment tests can maximize power of neuropsychological study to be useful to predict neuropsychological outcome following anterior temporal lobectomy. The CAT provides a method to select assessment procedures and inform clinical decision making using Bayesian statistical modeling.

Conclusions: Use of CATs should guide neuropsychology clinical decision making. Epilepsy care will benefit from increasing use of evidence-based neuropsychology practice that is informed using CATs. There is increasing evidence sufficient to development of practice parameters for neuropsychology procedures in the care of patients with epilepsy. An expert panel will then discuss the proposed neuropsychology practice parameters using real world examples.

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Evidence-Based Practice: Putting Research to Work in Clinical Decision Making

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Background and Aims: Theoretically, a key component of evidence-based clinical neuropsychology is "the integration of 'best research' derived from the study of populations to inform clinical decisions about individuals" such that the clinician is to reduce uncertainty about functional and diagnostic questions in a manner that is publically verifiable and meaningful to the patient. The aim of this presentation is

to illustrate how simple Bayesian tools can be easily applied to group data in test manuals and research reports to extract the Test Operating Characteristics (TOC) of a patient's scores to better inform clinical decision making.

Methods and Results: By shifting our frame of reference from "how much" to "how many," patients' test scores can be viewed as individual "outcomes" and interpreted in terms of their sensitivity, specificity, and odds and diagnostic likelihoods within a Bayesian TOC framework. Even when not presented in a test manual or research report, it is possible to use simple calculators to extract TOC information about a given patient's test scores. This is demonstrated via case examples.

Conclusions: Every patient's test data can be viewed as an individual outcome and interpreted within the context of published research. By using simple Bayesian methods it is possible to determine/estimate the specific Test Operating Characteristics (TOC) of a given patient's specific test scores to inform clinical decisions about that individual.

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Concurrent Session 8

Social-emotional cognition in healthy and pathological populations

Empathy in young people: Change in brain function with the manipulation of visual attention to emotional faces

Bruggemann, Jason^{1,2}, Burton, Karen^{1,2}, Laurens, Kristin¹, Macefield, Vaughan², Dadds, Mark³, Green, Melissa¹ and Lenroot, Rhoshel^{1,2}

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Background and aims: Understanding emotional states of others is fundamental to effective social interaction and the development of empathy. Critical information is conveyed via the eyes, and reduced attention to the eyes is associated with poorer emotion recognition and empathic deficits in individuals with autism or conduct problems. Deliberately redirecting attention to eyes can improve behaviour, but its effect on brain activity during emotional processing has not been studied previously. Our aim was to determine whether manipulation of visual attention in youths affects their brain responses to expression of emotions in others.

Method: Thirteen typically developing males aged 8-16 performed an implicit facial emotion processing task while viewing different facial expressions (fearful, neutral, happy), presented under three different instructions: undirected, eye-gaze and mouth-gaze. fMRI and autonomic measures were acquired concurrently, along with eye tracking as a measure of visual attention.

Results: Viewing fearful faces in the undirected condition increased brain activity in frontal (e.g., frontal gyrus), limbic (e.g., amygdala) and occipital (e.g., fusiform) regions. Eye tracking indicated that participants attended to the eyes more than the mouth in the undirected condition. Attention directed to eyes elicited greater activity in frontal regions than undirected attention.

Conclusions: These data demonstrate that manipulation of visual attention modulates frontal activity, perhaps reflecting greater engagement of executive function. Undirected eye-gaze patterns indicate natural orienting to eyes in healthy youths. Understanding the effects of manipulating attention on healthy brain activity provides a basis for ongoing work examining potentially perturbed response patterns in a conduct problem cohort.

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Gaining insight into the functional role of the mirror neuron system from traumatic brain injured patients

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Background and aims: The disrupted capacity to understand, process and express emotional information found in people with severe traumatic brain injury (TBI) has a major impact on their social functioning. The discovery of the mirror neuron system (MNS) in the human brain has provided a neurobiological substrate for understanding human social cognition directly relevant to the emotional processing deficits observed in TBI. While a large body of research has investigated MNS function in Autism Spectrum Disorder (ASD), there have been no studies investigating MNS functioning in individuals with TBI. However, this group represents an important opportunity to examine MNS function in a population with an acquired social cognition deficit, in contrast to the developmental deficit found in ASD.

Method: 19 adults (15 male, age 44.9, SD = 13.7), who had sustained a TBI, and 19 age, sex and education matched healthy controls participated. Electroencephalography was recorded while participants viewed repeated presentations of happy and angry facial expressions. Event-related power in the lower alpha (8-10 Hz) and upper alpha bands (10-12 Hz) was derived for expression (happy vs. angry), and group (TBI vs. Controls).

Results: Suppression was found in the lower alpha band to the happy but not the angry faces for both groups. For the upper alpha band suppression was found to both facial expressions, and this was larger to angry faces for controls compared to the TBI group ($F(1,36) = 9.7, p < .001$).

Conclusion: These findings suggest disrupted functional connectivity in neural networks that process negative affect following TBI. Possible treatments to repair functional connectivity will be proposed.

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Willing or not? Problems understanding sincerity after severe Traumatic Brain Injury

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Background: Many people with severe traumatic brain injury (TBI) have difficulties understanding indirect language, e.g. sarcasm. But do they have problems judging the relative sincerity of speakers who, while not frankly sarcastic, are less than sincere in their remarks?. This study examined perception of sincerity and its relation to cognitive impairments (e.g. working memory) and social cognitive abilities (e.g. emotion perception).

Methods: 24 adults with severe TBI and 25 adults from the community watched video vignettes of four actors volunteering for additional duties. Each speaker made a remark that literally suggested they were willing to be involved. Their sincerity, however, was moderated by their emotional demeanour. Participants rated each speaker for sincerity (0-100%). Measures of cognitive and social cognitive function were also taken.

Results: The TBI group was less consistent ($\alpha = 0.65$) in how they ranked sincerity of the actors compared to the control groups ($\alpha = 0.90$). They were worse at differentiating between sincere and insincere expressions and rated insincere expressions as more sincere, although they rated sincere expressions similarly. Poorer working memory and poor

social cognition were associated with these difficulties detecting insincerity and sarcasm in the TBI group but only social cognition was uniquely associated.

Conclusions: Adults with TBI have difficulty detecting not only sarcasm, but relatively insincere remarks. This seems to be specifically related to poor social cognition abilities.

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Developing an Observational Measure of Social Disinhibition after Traumatic Brain Injury Osborne-Crowley, Katherine¹; McDonald, Skye¹ and Francis, Heather M.¹

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Background and aims: Measurement of social disinhibition after traumatic brain injury (TBI) has been inconsistent across studies, often subject to patient and informant bias. This study aimed to develop an observational measure of socially disinhibited behaviour for use in a TBI population.

Method: 21 adults with severe TBI (mean age 50.10 years) and 21 control participants (mean age 45.29 years) were videotaped interacting with an experimenter. Interactions were rated by two blind, independent raters for disinhibited behaviours. Participants also completed tests of inhibition, working memory and processing speed. Relatives of participants with TBI completed the Neuropsychiatric Inventory (NPI; Cumming et al., 1994) and Sydney Psychosocial Reintegration Scale (SPRS; Tate et al., 1999). **Results:** Inter-rater absolute agreement for social disinhibition ratings was good, ICC=.69. Mean ratings provided for TBI participants had significantly larger variance than controls, $F=8.25, p=.006$. In the TBI group, the ratings were positively correlated with the NPI frequency ($r=.49, p=.023$) and distress scores ($r=.46, p=.034$). A hierarchical regression predicting social disinhibition ratings in the TBI group revealed that the addition of formal inhibition measures led to a significant increase in R^2 of .382, $F(2,10)=6.45, p=.016$.

Conclusions: The observational measure demonstrated good inter-rater reliability and construct validity. Formal measures of inhibition were shown to predict observed social disinhibition. The social disinhibition ratings, however, were unable to predict outcomes such change in employment or in interpersonal relationships.

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Do I know you? Examining memory for faces in frontotemporal dementia

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Background and aims: The ability to remember and recognise people is a crucial skill for social interactions. This ability is proposed to be coordinated by neural regions in the occipital and temporal lobes, specialised for face perception and memory. The extent that these deficits occur in frontotemporal dementia, a younger-onset dementia syndrome characterised by atrophy to the frontal and/or temporal lobes, however, has been relatively underexplored. Here, we aimed to systematically examine the cognitive and neural basis of face perception and memory in two frontotemporal dementia phenotypes.

Method: 13 behavioural-variant frontotemporal dementia (bvFTD) patients, 11 semantic dementia (SD) patients and 11 healthy controls completed novel experimental tasks assessing: face perception (Identity-Matching), face memory (Cambridge Face Memory Test) and object memory (Cambridge Car Memory Test).

Results: Both bvFTD and SD showed reduced face perception (bvFTD: $p=.001$; SD: $p=.055$) and impaired face recognition (both p values $<.001$). In contrast, only bvFTD showed impaired object memory ($p=.032$), consistent with their reported episodic memory deficits. Voxel-based morphometry analyses revealed face perception and memory were associated with integrity of the bilateral temporal fusiform cortex and bilateral anterior temporal lobe, in both SD and bvFTD. In contrast, object memory was associated with thalamic integrity in bvFTD only.

Conclusions: Our results reveal that face perception and memory are affected in both bvFTD and SD, due to degeneration of regions within the “core” and “extended” face processing system. From a clinical perspective, impaired ability to recognise familiar faces is an under-recognised deficit in these patients, which likely contributes to the pervasive social deficits observed in frontotemporal dementia. Strategies to improve face perception and memory could therefore prove beneficial.

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Neural correlates of emotion and social cognition in frontotemporal dementia

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Background and Aims: Social-emotional disturbance is common in frontotemporal dementia, a progressive neurodegenerative disease affecting predominantly the frontal and temporal lobe regions. These deficits are particularly pronounced in the behavioural-variant and semantic dementia syndromes. The contributions of frontal brain regions to specific aspects of social cognition remain, however, poorly defined.

Method: Patients with behavioural-variant frontotemporal dementia (bvFTD, $n=16$), and semantic dementia (SD, $n=16$), as well as 10 patients with Alzheimer’s disease and 16 age-matched healthy controls were recruited for this study. Here, we investigated social-emotional functioning using the Socio-Emotional Questionnaire. Voxel-based morphometry analyses were also carried out to determine the brain regions associated with task performance.

Results: Carer ratings revealed significant deficits in emotion recognition and empathy in bvFTD and SD groups (all p values $<.001$), but sociability and antisocial behaviour were unchanged. In contrast, AD patients were rated similarly to controls on all measures. Neuroimaging analyses indicated that emotion recognition and empathy ratings were associated with a common network including the orbitofrontal cortex, temporal pole, insula and parahippocampal gyrus, bilaterally. Conversely, sociability was associated with the left temporal pole only.

Conclusions: Our results confirm the importance of frontotemporal brain regions for social cognition and further indicate that these regions underpin specific subcomponents such as emotion recognition and empathy.

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PLENARY 2. How International is International Neuropsychology? A Review of Evolving Challenges and Opportunities

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Globalisation, technological advancements, and immigration have made the world more connected with the effect of a significant merging of previously disparate cultures and social values. The outcome has also been to highlight economic and ecological inequalities. As a result neuropsychologists around the world are increasingly being faced with the myriad of challenges and opportunities that arise out of working in a rapidly fluctuating multicultural and multilingual world. Until recently, most research and knowledge in neuropsychology has had its roots in the global north-west and as such has been the neuropsychology of the socio-economically advantaged, highly educated, predominantly white European and American middle classes. In respect of other frequently less socio-economically and educationally advanced cultural contexts largely in the global south, scientific insights in the field are in many instances still evolving. Furthermore, whilst the role of neuropsychologists is largely taken for granted in the global north-west, in many countries in the global south the development of neuropsychological research programmes, training and service delivery is considered a low priority as the focus is on issues such as poverty, food security, natural disasters, wars, civil conflicts, political instability, violence, and the delivery of primary healthcare services. Neuropsychologists working in these countries thus have to demonstrate their relevance to the service of humanity.

This presentation will discuss overarching principles and issues relating to ethnic diversity and scientific universality that impact on neuropsychology. In addition, critical applied aspects within the discipline will be addressed, including (i) the importance of socio-cultural context, and particularly language within the assessment and therapeutic domains, and for understanding the impact of brain trauma and disorders; (ii) education and training goals and initiatives; (iii) diagnostic issues within the context of the World Health Organization’s revision of the International Classification of Diseases (ICD); (iv) ethical, legal and policy imperatives. Lessons learnt from the African context will be used to highlight the challenges and opportunities related to such work.

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To err is human; to self-regulate after brain injury, divine

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Brain injury can reduce people’s ability to monitor their own actions and identify and correct errors on everyday tasks. This usually occurs because of damage to neural pathways that support “metacognition” or the higher-order capacity to reflect upon and regulate one’s own cognitions and behaviour. Over the last few decades the evidence base supporting the efficacy of error-based learning or metacognitive training approaches in rehabilitation has advanced considerably. Error-based learning typically involves the use of structured real life activities that provide the opportunity for people to learn to recognise and correct their own errors and develop strategies. Similarly, approaches to measuring error behaviour have been extended from the laboratory and clinic to people’s real life environments. This talk will provide an overview of the theory and evidence supporting the utility of assessments of error behaviour and rehabilitation approaches targeting error-based learning.

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THURSDAY POSTER SESSION

#	Presenter	Title
Poster Symposium 1		Rare and Unusual Syndromes: Neuropsychological Perspectives
1	Wilson, Barbara	Alexander Disease
2	Rose, Anita	Evans Syndrome
3	Winegardner, Jill	Diogenes Syndrome
4	Perdices, Michael	Alice in Wonderland Syndrome
Poster Symposium 2		Exploring Autobiographical Memory
5	Fitzgerald, Zoe	Autobiographical memory disturbance and accelerated long-term forgetting in frontal lobe epilepsy: a single case study
6	Lechowicz, Meryn	Selective impairments in recall of past and generation of future autobiographical events in patients with unilateral temporal lobe epilepsy
7	Mothakunnel, Annu	Association between self-reported and objective autobiographical memory performance in patients with focal epilepsy and normal control subjects
Poster Symposium 3		Memory in children
8	Phillips, Natalie	Computerized rehabilitation of working memory following pediatric traumatic brain injury: Preliminary findings of a randomized double blind controlled trial.
9	Brookes, Naomi	Assessment of post traumatic amnesia in children aged 4 – 7 years: Initial steps in the development of a new scale
10	Cooper, Janine	A functional neural network for adolescent autobiographical memory: A pilot study.
11	Adlam, Anna	Evaluating a prospective memory intervention for children who have survived a brain injury
12	Briggs, Rachel	Westmead Post-Traumatic Amnesia Scale as a predictor of functional outcome in school-aged children with traumatic brain injury
Posters		
13	Adachi, Satsuki-A	Language Development in School-aged Children with Pervasive Developmental Disorders: Examining Relationships among Syntactic, Vocabulary, and Speech Abilities
14	Afshar, Soheil	Long-Term Cognitive Outcomes After Paediatric Liver Transplantation: Waiting time matters
15	Annett, Robert	Mu-Rhythm Suppression Predicts Bayley Scales of Infant Development-III in 3-Month Term and Preterm Infants
16	Baird, Ameer	Does music training modulate the mnemonic effect of song in Alzheimer's Dementia? A comparison of musicians and non-musicians
17	Behen, Michael	Length of adversity predicts deprivation-specific symptoms in children with histories of neglect and placement in foster care
18	Bolanos, Maria De Lourdes	Executive Function profile from young adults with, and without, persistent ADHD symptoms
19	Bunting, Jessica	Who receives ongoing care after paediatric mild Traumatic Brain Injury?
20	Chang, Hsin-Te	The potential sensitivity of verbal list learning test in detecting subjective cognitive decline and amnesic mild cognitive impairment
21	Cohen, Miriam	Decoding emotion from abstract art in frontotemporal dementia
22	De Jonghe, Jos	Symptom Validity Testing based on Visual Associations. Development of the Visual Association Symptom Validity Test (VASVT)
23	De Jonghe, Jos	The Assessment of Depression Inventory (ADI) Dutch Version. First Findings in Normal Controls and Instructed Simulators
24	Dong, Yanhong	Neuropsychological patterns of impairment in Parkinson's Disease patients in Singapore
25	Doshi, Kinjal	Overprotective caregiving behaviors among informal caregivers of elderly Singaporeans with mild cognitive impairment
26	Falkenberg, Kate	Comparing online versus face-to-face delivery of an aphasia conversation partner training program for healthcare professionals: A pilot randomised controlled trial
27	Fields, Julie	Success of behavioral interventions for individuals with mild cognitive impairment and their caregivers may be related to sex differences
28	Fujita, Takashi	Factors influencing instrumental activities of daily living in patients with mild-stage Alzheimer's disease
29	Gates, Nicola	Promoting cognitive health in adults at risk of dementia: A Life-style intervention program
30	Gracey, Fergus	Protocol and preliminary findings of a multi-centre randomised controlled feasibility study of an Arts for Health group ("HeART of Stroke", HoS) to support self-confidence and well-being

		following stroke.
31	Green, Leesa	Exploratory investigation of the effects of motor symptoms on the assessment of mood in Parkinson's disease
32	Hashimoto, Naoyuki	Effects of moderate aerobic exercise on cognitive function and cerebral blood flow
33	Hatta, Takeshi	Relationship between odor identification and cognitive functions in healthy aged people
34	Hayashi, Atsuko	Kanji character recall in Japanese patients with mild cognitive impairments and mild Alzheimer's disease
35	Hessen, Erik	T-tau is associated with objective memory decline over 2 years in persons seeking help for subjective cognitive decline. A report from the Gothenburg-Oslo MCI study.
36	Higashikawa, Mari	Augmentative and Alternative Communication (AAC) using Information and Communication Technology (ICT) which are available for the patients with aphasia and higher brain function disorders
37	Hodge, Antoinette	Improving access to assessment services for rural children using videoconference technology
38	Honan, Ingrid	The Bayley Scales III: A performance comparison of Australian 12 month-old children with the United States normative sample.
39	Hsieh, Sharpley	The evolution of carer burden in frontotemporal dementia with and without motor neuron disease
40	Hsieh, Sharpley	Loss of empathy across the amyotrophic lateral sclerosis -frontotemporal dementia spectrum
41	Iwahara, Akihiko	Not Motivational Reserve but Cognitive Reserve Acts as a Buffer of Cognitive Decline
42	Johanidesova, Silvie	Neuropsychological Aspects of Creutzfeldt-Jakob Disease
43	Jungers, Melissa	Comprehension and production of pragmatic prosody in individuals with Williams syndrome
44	Kirchner, Rebecca	Investigation into the adaptive behavior, developmental, and cognitive phenotype of infants and toddlers with Williams syndrome
45	Kisilev, Sergey	Long-term memory in ADHD children
46	Knight, Sarah	Detecting cognitive fatigue in adolescents with chronic fatigue syndrome: Piloting a novel paradigm
47	Kozlovskiy, Stanislav	Age-related mammillary bodies atrophy and memory characteristics in healthy people
48	Kozlovskiy, Stanislav	A method for early detection of the risk of cognitive impairments
49	Kvelde, Tasha	"Making the Most of Your Memory": a pilot study in a group of older adults with subjective and objective memory complaints.
50	Leathem, Janet	Exploration of the relationship between Working memory, academic achievement and behaviour.
51	Thornton, Anneke (Janet Leathem)	Short Term Cognitive Change during Electroconvulsive Therapy for Unipolar and Bipolar Depression: A Prospective Study
52	Thornton, Anneke (Janet Leathem)	Introducing the CASDECT – a Cognitive Screening Measure for use during Electroconvulsive Therapy
53	Lee, Stephen	Predictors of Subjective Memory Decline in a Community Sample of Older Adults: A Structural Equation Model Analysis
54	Martin, Katherine	A new cognitive and sensory stimulation intervention in psychogeriatrics
55	Matsui, Mie	Normal Development of Human Brain White Matter from Infancy to Early Adulthood: A Diffusion Tensor Imaging Study
56	Moes, Elisabeth	Early Life Predictors of Need for Cognition in Healthy Older Adults
57	Murray, Andrea	Neurocognitive and symptom trajectories of ADHD from childhood to early adolescence
58	Nagai, Chiyoko	Atypical progressive aphasia with anterior temporal lobe atrophy
59	Nakagawa, Yoshiko	Grammatical Difficulties for Adults with Developmental Disorders
60	Nugent, Lauren	Factors That Influence Decision Making: An Explanatory Framework
61	O'Keefe, Valorie	Practitioners and Other Health Professionals to Use in Determining Fitness to Drive for Older and Cognitively Impaired Patients?
62	O'Meagher, Sari	Does the performance of preterm preschool children on executive function tests predict executive functioning in real life?
63	Parveen, Amira	Academic backwardness, a predictor of specific learning disorder
64	Pozzebon, Margaret	Spouses' Experience of Living with Dementia: A synthesis of the qualitative research
65	Reeve, Jessica	Executive Function in Adults with Williams Syndrome
66	Regan, Bridget	MAXCOG: a randomised control trial of individualised cognitive rehabilitation for clients with mild cognitive impairment and early dementia
67	Roberts, Kirrily	Stability of diagnosis in behavioural-variant frontotemporal dementia
68	Rossiter, Sarah	Long-term outcome following mild or moderate pediatric head injury

69	Ryan, Sarah Johanna	Three decades on: language competence and self-reported satisfaction with social relationships in adults with a history of childhood traumatic brain injury
70	Savage, Sharon	That looks like the Queen, but it's really Aunty Mary: Face-name training in semantic dementia
71	Schuurs, Alana	Recognising Fear of Falling in a Community Rehabilitation Setting
72	Sewell, Katherine	Characterisation of Aggression in Huntington's disease: types, antecedents and treatment implications.
73	Szeto, Jennifer	Clinical features associated non-tremor dominant Parkinson's disease
74	Taylor, Cathleen	Aspects of natural conversation in Primary Progressive Aphasia.
75	Virudhagirinathan, Baboo Sankar	Attention deficit hyperactivity disorder, a co-morbid factor in specific learning disorder (sld)
76	Walton, Courtney	Cognitive training in Parkinson's disease: A meta-analysis of randomized controlled trials
77	Willis, Claire	Can we participate? Barriers and facilitators to community participation in children with an acquired brain injury
78	Wong, Stephanie	Social cognition and the self-reference effect in Alzheimer's disease and behavioural variant frontotemporal dementia
79	Zeleny, Vanessa	The fluency flip: Identification of prodromal Alzheimer's disease in Mild Cognitive Impairment
80	Zhang, Yumei	Resting-state Functional Magnetic Resonance Imaging of Patients with Leukoaraiosis and Mild Cognitive Impairment: A cross-sectional study

THURSDAY POSTER ABSTRACTS

Alexander Disease

Wilson, Barbara A.¹

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Background and Aims: First described by Alexander, an Australian pathologist working in the United Kingdom in 1949, this rare and fatal disorder is caused by a genetic mutation. One of the leukodystrophies, it affects the development of the myelin sheath with a progressive decline of cognitive abilities. Infants and children are typically affected. Fewer than 600 cases have been reported.

Method: At 5 years old, N.F. was diagnosed with Alexander Disease. Now 36 she has survived far longer than most people with the condition. A CT scan in 2010 showed generalised atrophy with thickening of the frontal bones and low density within the deep white matter bilaterally. She was assessed at the age of 34 then reassessed twice more to monitor decline.

Results: The conclusions to the first assessment were that N.F. was alert and able to concentrate for short periods. She was sociable and tried to communicate. She smiled readily. She could read and write her own name. She was not oriented to time or place. She had poor recognition memory. Her basic perceptual ability seemed reasonable. When reassessed after a hospital admission, she was much less responsive, less sociable and more withdrawn; no longer able to write her own name or to point to the correct spelling of her first name. The final assessment 8 months later showed no evidence of further decline.

Conclusions: Although severely cognitively impaired, N.F.'s decline is slow and she still has a reasonable quality of life.

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Evans Syndrome

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Background and Aim: Evans syndrome (ES) was first described in 1951 by Robert Evans. ES is a rare haematological autoimmune disease in which the body makes antibodies that destroy platelets and red and white blood cells. Individuals with ES can present with deficits in all three of these blood cells at any one time, or may only have deficits in one or two of them. The exact pathophysiology is unknown,

however it is noticed that regular relapses of the condition can occur. There has been rare documented evidence of an association with ES and inflammation of the central nervous system (e.g. Simon et al., 2013), thus suggesting relevance for hematology and neurology alike.

Method: DV is a 44 year old man who was diagnosed with ES in 2007 following a 5 year history of symptomatology. In July 2010 DV had a relapse and subsequently contracted meningitis and a stroke in the hypothalamic region. DV has been regularly assessed since 2012.

Results: Initial assessment highlighted significant decline in IQ compared to pre-morbid predictors. He had intact comprehension and perceptual abilities and was able to communicate using gestural responses. In 2014 he developed pneumonia and was admitted to hospital. On his return his cognitive profile had further deteriorated and his ability to communicate was inconsistent and he was less responsive.

Conclusions: As a result of DV's propensity to immune deficiencies and resulting infections cognitive deterioration has occurred impacting on his communication ability and responsiveness to his environment.

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Diogenes Syndrome

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Background and Aims: Diogenes Syndrome (DS) is predominantly a geriatric syndrome characterized by extreme self-neglect, domestic squalor, excessive hoarding, social withdrawal and a lack of concern for the individual's residential situation. This cluster of symptoms was first described in a case series of 76 patients (McMillan, 1966) and has been confirmed by a number of other studies. The mortality rate is high, with an estimated 46% dying within 5 years of diagnosis. It often co-occurs with psychological disorders and medical conditions.

Methods: TD is a 54-year-old man with DS who, at initial assessment, was unable to identify emotional expressions of disgust and was borderline impaired for facial recognition associated with perceptual difficulties. Difficulties with

interpreting expressions of disgust was interesting in light of TD living in squalor, and the question arose as to whether the basis of his difficulties could be explained by neuropsychological and/or psychological deficits; TD was assessed on 3 separate occasions.

Results: Neuropsychological assessment was not indicative of executive dysfunction, including difficulties associated with understanding consequences of living in squalor. However, TD consistently stated he would never live nor had he ever lived in squalor. Assessment of emotion-based decision-making and interoception was normal. Olfactory functioning was impaired. Measurement of subjective feelings of shame was abnormally low.

Conclusions: The assessment results do not provide clear evidence as to whether TD's difficulties were caused by psychological and/or neuropsychological impairments. Further research is required to understand the processes underpinning the consequences of DS in order to provide appropriate intervention

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Alice in Wonderland Syndrome

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Background and Aims: The Alice in Wonderland syndrome (AWS; Todd, 1955) is characterized by transient episodes of disordered body image (body is perceived as being larger/smaller than usual). In addition, impaired judgment of time perception, dissociative symptoms (depersonalization/derealization) and visuo-perceptual distortions (metamorphosis, micropsia, macropsia, teleopsia and pelopsia) are often concurrent. AWS has been associated with migraine or epilepsy, although other aetiologies have also been implicated. Neurophysiological and cerebral perfusion abnormalities (occipital, parietal and frontal regions) have been reported, but perusal of the literature reveals no reports of neuropsychological function in AWS.

Method: NA is a 45 year old right handed woman who in 2010 experienced three episodes suggestive of AWS. These were characterized by depersonalization, topographical disorientation, pelopsia, and distortion of time perception. Neuropsychological assessment was performed approximately one month after her last episode. Prior to these episodes NA had suffered non-migranous throbbing intermittent headaches. She had a history of TIA characterized by facial numbness and dysarthria. Subsequent brain MRI showed a few areas of deep white matter hyperintensity.

Results: Assessment revealed impairment of: i) learning and recall, particularly for non-verbal information; ii) sustained and selective attention primarily reflecting deficits in processing accuracy; iii) planning, conceptual flexibility and working memory; and iv) visuoconstruction. Impairments ranged from subtle to severe. Symptoms suggestive of severe anxiety were also evident.

Conclusions: The cognitive deficits demonstrated by NA could not be readily attributable to her previous TIA. It is unclear, however, whether or not they were a manifestation of AWS.

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Autobiographical memory disturbance and accelerated long-term forgetting in frontal lobe epilepsy: a single case study

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Background and aims: Epilepsy is commonly accompanied by memory disturbances, in particular remote impairment of autobiographical memory (AM) as well as the clinical phenomenon of accelerated long-term forgetting (ALF), which is characterised by intact initial recall with subsequent abnormal decline over extended delays of days or weeks. Reports have commonly identified AM and ALF in patients with transient epileptic amnesia and temporal lobe epilepsy despite relatively normal performance across other cognitive domains on standard neuropsychological assessment. Unique to this study, AM and ALF are investigated in patient DM who complained of poor AM after his diagnosis of nocturnal frontal lobe epilepsy at age 30.

Method: DM was a 39-year-old English speaking man of average range intelligence. He completed a comprehensive battery of neuropsychological tests including the Autobiographical Memory Interview and Public Events Questionnaire. His memory performance was further examined on two anterograde memory tasks (word and design lists) that were used to test recall over delays of 30 min, 24 hr, 4 days and 4 weeks and compared to 14 healthy controls.

Results: Against a background of relatively normal cognitive function, retrograde memory testing showed DM had extensive retrograde amnesia affecting both remote and recent autobiographical memories and memory for public events. While DM's free recall at a standard delay (30 min) was within normal limits for both verbal and nonverbal anterograde memory tasks, by 4 days, significant ALF was evident on measures. Further abnormal forgetting was also apparent for DM between delays of 4 days and 4 weeks for the verbal memory measure.

Conclusions: This case illustrates that AM and ALF are not restricted to temporal lobe epilepsy or transient epileptic amnesia, but can also be found in patients with epilepsy of frontal lobe origin. The possibility that AM impairment is a consequence of ALF will be discussed.

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Selective impairments in recall of past and generation of future autobiographical events in patients with unilateral temporal lobe epilepsy

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Background and Objectives: Patients with unilateral temporal lobe epilepsy (TLE) are impaired in recall of episodic details for past and future events. Yet, it is unknown if (i) these impairments involve all or only some types of episodic details, and (ii) the patterns of impairments are related to the site or side of epilepsy focus/pathology.

Method: Twenty patients with unilateral TLE (10 left and 10 right) and 20 healthy controls participated. Twelve patients

had evidence of structural hippocampal damage. We assessed recall of past and generation of future autobiographical episodes using the Adapted Autobiographical Interview, which provided five separate categories of episodic details: Event, Place, Time, Perceptual and Emotion/Thoughts.

Results: Mann-Whitney U Tests revealed that patients with TLE provided significantly fewer Event, Place and Perceptual details for past ($p_s < .001$; $.002$; $.001$) and future ($p_s < .001$; $.009$; $.009$) events, but did not differ from controls in the number of Time and Emotion/Thought details delivered. When subdivided by (i) the site of lesion, patients with structural hippocampal abnormalities provided significantly fewer Emotion/Thought details ($p = .024$) for future events relative to patients without hippocampal abnormalities, (ii) the side of lesion, patients with left TLE provided significantly fewer Perceptual details for past and future events ($p_s = .035$; $.009$) and Time details for past events ($p = .011$) compared to patients with RTLE.

Conclusions: Our study reveals that patients with unilateral TLE have selective deficits in recall of past and generation of future episodic details. Moreover, the study indicates that side and site of epilepsy focus are associated with distinct patterns of deficits: impaired recall of emotional details with hippocampal abnormality and impaired perceptual and time details with left hemisphere focus.

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Association between self-reported and objective autobiographical memory performance in patients with focal epilepsy and normal control subjects

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Background and objectives: Autobiographical memory (AM) impairments can occur in patients with epilepsy. We aimed to verify the sensitivity of a brief autobiographical fluency task (AFT) for detecting these deficits and also to examine whether self-report responses on an AM questionnaire predict AFT performance.

Method: Sixty neurologically normal control (NC) subjects and 20 patients with focal epilepsy (PWE) aged 18-65 completed an 8-item self-report AM questionnaire concerning how well they remembered different things from their lives (using a 5-point Likert scale ranging from "Not at all" to "Extremely well"). An AFT, which required recall of as many life events as possible from 3 specified time periods, given 90 seconds each was also administered.

Results: Total score on the AFT was not associated with age, sex or education. A one-tailed t-test revealed that patients reported fewer events on the AFT compared to controls ($p = .04$). However, NC and PWE groups did not differ on mean response score to any of the self-report questionnaire items. For controls, the total questionnaire scores and 7 of the 8 individual items were significantly correlated with AFT performance. When items were entered into a step-wise multiple linear regression analysis, the question "How well are you able to remember big events such as weddings, celebrations or trips?" was the best at predicting AFT performance, accounting for 29% of variance. The question "How well do you remember events from your teenage years that others also remember?" accounted for an additional (significant) 6% of the variance in AFT scores. No questions predicted patient's AFT performance.

Conclusions: The AFT detected AM impairments in PWE. Self-reported AM was correlated with objective measures of AM in NC subjects and this study identified the most sensitive questions to ask. However, PWE showed little insight into their own AM abilities.

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Computerized rehabilitation of working memory following pediatric traumatic brain injury: Preliminary findings of a randomized double blind controlled trial.

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Background and aims: Children who sustain traumatic brain injury (TBI) are at risk of deficits in working memory (WM; comprising: central executive [CE], phonological loop [PL] and visuo-spatial sketchpad [VSSP]). This study examined whether WM can be improved by a computerized training program (COGMED) in this patient population.

Method: Randomised double blind controlled trial (RCT). Eighteen participants (8-15 years, > 12 months post TBI) completed adaptive (intervention group, n=9) or non-adaptive (active control group, n=9) versions of the program. WM was assessed pre-, on completion and 3 months post-training. The Automated Working Memory Assessment subtests: Mr X and Counting Recall, Digit Recall and Dot Matrix tested the CE (visual and verbal), PL, and VSSP, respectively.

Results: The first Group by Time (pre- vs. completion) ANOVA revealed a significant interaction (training effect) on the Dot Matrix subtest ($p < .001$); a significantly greater increase in scores in the intervention relative to the control group. A main effect of Time (practice effect) was significant for the Dot Matrix ($p < .001$) and Digit Recall ($p = .04$) subtests. The second Group by Time (pre- vs. 3 months post-) ANOVA, showed a trend towards same significant interaction (maintenance; $p = .07$). No other main effects of time, group or interactions were significant in either analyses.

Conclusions: Findings of this first, to our knowledge, RCT that examined effects of COGMED on WM in children with TBI provide preliminary evidence that the adaptive training, which challenges WM to its limits is associated with significant, albeit selective WM gains.

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Assessment of post traumatic amnesia in children aged 4 – 7 years: Initial steps in the development of a new scale

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Background and aims: Length of post traumatic amnesia (PTA) is an indicator of TBI severity and a valid predictor of

functional outcomes in adults and older children (≥ 8 years). PTA evaluation typically involves serial testing of orientation and memory with a standardized scale. Scales that could potentially be used for assessment of PTA in young children have significant shortcomings. Here, we examined developmental validity of a new PTA scale for children aged 4 to 7 years.

Method: A new PTA scale containing 10 items (5 orientation and 5 memory items) was administered over 3 days to 52 typically developing children (26 male, 26 female) aged 4 to 7 years over.

Results: Orientation: a repeated measures ANOVA revealed a significant effect of the Age Group ($F(3, 48) = 7.44, p < .001$), but not Days Tested ($F(2, 96) = 0.35, p = .71$) or interaction ($F(6, 96) = 0.12, p = .99$). Four-year-old children gave significantly fewer correct answers compared to 6- and 7- (but not 5-) year-old children. Memory: main effects of Age Group ($F(3, 48) = 4.85, p = .005$) and Days Tested ($F(1, 48) = 9.54, p = .003$) were significant. The interaction was not significant ($F(3, 48) = 1.20, p = .32$). Four year-old children scored significantly below 6- and 7-year-old children. Across age groups, memory scores dropped significantly from the second day of testing (day 2 > day 3). Analysis of item responses indicated that 60% of children failed at least one item on one of the days of testing which would suggest that they were in PTA when they were not. However, 5 items emerged (3 orientation and 2 memory items) that were answered correctly by all but 1 child on each day of testing.

Conclusions: This study identified a set of 5 items that have very good developmental validity, which potentially could be used to assess PTA (orientation and memory) in children aged 4 to 7 years.

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A functional neural network for adolescent autobiographical memory: A pilot study

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Background and aims: During adolescence, the ability to recollect autobiographical memories (ABM) to validate past experiences and plan future behaviour and actions is a prerequisite for independent living. Adolescence marks a period of physical, psychological and contextual change, some of which can be attributed to structural and functional changes occurring within the brain. In accordance, individuals progressing through the developmental period of adolescence are prime candidates for investigating the ongoing developmental and associated neurofunctional trajectory of ABM. However, unlike studies of adults, to date there has been little investigation of either during the adolescent period. In direct response to this, we have modified the Covert Events Task for use as a functional event related scanning paradigm to allow the investigation of the neural basis and trajectory of adolescent remote ABM recall.

Method: Eight typically developing adolescents, aged between 13.6-18.2 years ($M = 15.64, SD = 1.24$) recalled cued personal memories for remote events during event related functional scanning.

Results: There is a functional network for adolescent recall of remote memories that engages the right hippocampus, mid temporal gyrus, and regions of the superior frontal and mid temporal gyri. Trajectory analyses revealed that adolescents engage the hippocampus in the early stages of remote ABM recall followed by various regions of the parietal gyri. The

adolescent brain is less lateralized during remote ABM recall than that reported in adults.

Conclusions: We believe the results of this pilot study could be developed further to investigate the effects of various causes of brain damage (i.e. childhood stroke, epilepsy, acquired brain injury) on ABM recall in children and adolescents. Furthermore, it could be integrated into rehabilitation programs to provide greater understanding of the potential functional benefits of treatment.

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Evaluating a prospective memory intervention for children who have survived a brain injury

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Background and aims: Prospective memory (PM) difficulties are common following paediatric acquired brain injury (p-ABI) and can lead to a failure to participate in meaningful activities and achieve future independence. Research has shown that adults with ABI can benefit from content-free cues to facilitate PM for everyday goals. This talk will present data from two single case studies evaluating a combination of metacognitive training with content-free cues (Stop Think Organise Plan; STOP text alerts) in children with pABI (12-17 years).

Methods: In Study 1 ($n = 7$), PM performance (making phone calls at set times) was measured at baseline (1-week) and then during cued (STOP alerts) vs. un-cued days following one session of metacognitive training. In Study 2 ($n = 10$), participants with average-range working memory (WM) and attention abilities were selected. PM performance (sending texts; daily goals) was measured at baseline (criterion of 33% or less accuracy on at least 2 days) and, following two metacognitive training sessions, on cued vs. un-cued days (intervention phase).

Results: Study 1 found that PM performance improved on cued but not un-cued days for most participants, with those not showing an improvement having additional WM and attentional difficulties. In Study 2, participants showed gains on PM performance (sending texts and everyday goals).

Conclusion: Everyday PM abilities in adolescents with pABI benefit from metacognitive training with content-free cues. Adolescents with average WM and attention abilities are likely to benefit the most. Future research evaluating the effectiveness and potential generalisation of the intervention is warranted.

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Westmead Post-Traumatic Amnesia Scale as a predictor of functional outcome in school-aged children with traumatic brain injury

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Background and aims: Duration of post-traumatic amnesia (PTA) measured by the Westmead Post-Traumatic Amnesia Scale (WPTAS) is a reliable indicator of traumatic brain injury (TBI) severity and relates to functional outcomes post

TBI in adults. This study aimed to assess whether WPTAS scores relate to functional outcomes in school-aged children with moderate to severe TBI.

Method: A retrospective cohort study. Outcomes at the first outpatient follow-up ($Md=53$ days after injury; $IQR=41.75-61.75$) for 55 children aged 8 to 16 years ($Md=12$; $IQR=10-14$) with a median PTA of 3 days ($IQR=2-6$) were scored by two independent raters on the Kings Outcome Scale for Childhood Head Injury (KOSCHI) and an extended version of the TBI Outcome Domain Scale (ODS).

Result: On the KOSCHI, 37 children made good recovery, 17 had moderate and 1 had severe disabilities. On the ODS, most common functional deficits included fatigue (47.7%), mood/behaviour (43.2%), cognition/memory/concentration (36.4%), headache (25%), mobility (15.9%) and sensory impairments (15.9%). Children with good recovery had significantly shorter PTA duration compared with those with moderate to severe disability on the KOSCHI. Point-biserial correlations showed that PTA duration was significantly correlated with the presence or absence of the following ODS deficits: mood/behaviour ($r_{pb}=-.41$, $p=.002$), cognition/memory/concentration ($r_{pb}=-.55$, $p=.0001$), mobility ($r_{pb}=-.45$, $p=.001$), communication ($r_{pb}=-.28$, $p=.04$), disinhibition ($r_{pb}=-.38$, $p=.004$) and somatic complaints ($r_{pb}=-.34$, $p=.01$), but did not relate to fatigue, headache, self-care or sensory impairments.

Conclusion: This was the first study to demonstrate that injury severity, as measured by the WPTAS, places children and adolescents at a greater risk of disability following TBI.
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Language Development in School-aged Children with Pervasive Developmental Disorders: Examining Relationships among Syntactic, Vocabulary, and Speech Abilities

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Objective: Language development in children with pervasive developmental disorders (PDD) has rarely been discussed based on the evaluation of language, examining each phase of language functions from comprehensive perspectives. This study aimed to clarify relationships among the development of syntactic, vocabulary, and speech abilities.

[Methods] Seventeen male school-aged children with PDD, aged 6 years and 2 months to 9 years and 0 months (mean: 7 years and 2 months) were studied, all of whom had been diagnosed with PDD by doctors during infancy. They underwent the following tests: the Syntax Test of Aphasia (STA), Picture Vocabulary Test (PVT), a verb test as part of the Test of Lexical Processing in Aphasia, Test of Question-Answer Interaction Development (Q&A) based on the S-S method, Raven's Colored Progressive Matrices (RCPM), and number counting as part of the WISC-III (AMS). Following instruction in the procedures, speech-language-hearing therapists individually conducted these tests.

Results: 1) Decreases in scores were observed in all tests, except for the intelligence test; 2) STA auditory comprehension was associated with sentence production, PVT, verb comprehension, Q&A, and AMS, while STA sentence production was associated with auditory comprehension, verb comprehension and expression, PCPM, Q&A, and AMS; and 3) the syntactic comprehension level was: I (word-meaning) in 8, II (word-order) in 7, and III (particle) in 2; none were defined in level IV (particle-complement sentences). Based on these results, speech impairment in children with PDD may be associated

with difficulty in appropriately acquiring vocabulary and syntactic abilities.

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Long-Term Cognitive Outcomes After Paediatric Liver Transplantation: Waiting time matters

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Background and Objectives: Liver transplantation is now standard therapy for children with end-stage liver disease. As survival rates post-transplant have improved, the focus has shifted to long-term outcomes. However, due to low organ donation rates, children are forced to wait for donor livers, leaving them vulnerable to the neurotoxic effects of end-stage liver disease. The aim of the study is to investigate whether children who wait longer have poorer outcomes.

Method: Twenty-six children (13 female) aged between 6 and 16 years ($M: 10.6$, $SD: 3$), who were at least one year post-transplant, were recruited and assessed using a comprehensive neuropsychological battery. Medical factors of interest were collected from medical records.

Results: Compared to population norms, participants perform significantly worse on measures of attention and working memory, fine motor skills and mathematics, with 50% meeting criteria for a learning disability in mathematics. Backwards regression models found that medical factors of interest, including time spent on waiting list, disease severity and days spent in intensive care, significantly predict long-term cognitive outcomes.

Conclusions: The findings from the study demonstrate that longer waiting times and greater disease severity at transplantation predict poorer long-term cognitive outcomes. These findings should inform future allocation policies to get livers to children more quickly and give children with end-stage liver disease a healthier start to life.

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Does music training modulate the mnemonic effect of song in Alzheimer's Dementia? A comparison of musicians and non-musicians

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Background and aims: There is accumulating evidence of structural and functional brain differences between musicians and non-musicians. Recent research has shown better memory for sung information (lyrics) compared with spoken information in persons with mild Alzheimer's Dementia (AD), but there has been no investigation of potential differences in this mnemonic effect between those with or without music training. Our aim was to explore whether musical training modulates the effect of learning and recall of practical verbal information presented in song by comparing

memory performance of musicians and non-musicians with and without AD.

Methods: We compared learning (5 trials), delayed recall (30 minute, 24 hour) and recognition of sung versus spoken information in 22 healthy elderly (15 musicians), and 11 people with AD (5 musicians).

Results: Non-musicians with AD showed significantly better total learning of spoken compared with sung information, while musicians showed the opposite pattern but this failed to reach statistical significance. There were no significant differences in recall or recognition of sung compared with spoken information for musicians or non-musicians (healthy or with AD). Non-musicians with AD could recall no information on delayed recall, but two of the five musicians with AD could recall some information, with their performances in keeping with healthy musicians.

Conclusions: Our findings do not support previous observations of a mnemonic effect of song for verbal memory in AD. The observation of better memory performance in musicians with AD compared with non-musicians with AD is in keeping with recent research demonstrating enhanced cognitive functioning, in particular memory, in those with music training. Our results have implications for the use of song as a verbal memory aid in the AD population. Putting verbal information in song does not benefit learning and recall memory for patients without music training.

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Length of adversity predicts deprivation-specific symptoms in children with histories of neglect and placement in foster care

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Background and Objectives: Children raised in orphanages evidence deprivation-specific behavioral phenotypes (DSBPs) including cognitive impairment, social problems, and an inattentive/overactive phenotype. Less research has examined whether children who experience neglect by parents and are subsequently placed into foster care evidence similar patterns. Also research on which factors/aspects of care predict pathological outcomes is limited. We aimed to identify the incidence of DSBPs in these children and to determine which factors predict the presence of such problems.

Method: 107 children (60 males, mean age=130.4±38.6 months) removed from their parents for neglect and placed into foster care, underwent cognitive evaluations. All had been adopted into permanent care by the time of the study. Caregivers completed behavioral checklists. Length of neglect, time prior to adoption, # of changes in care, and placement type (family vs. community) were collected. Incidence of cognitive impairment (FSIQ<78), and elevations (t-score>65) on 5 behavioral subscales were calculated. Regressions were run with age, gender, and each of the adversity variables entered as predictors; and global IQ and behavioral variables entered as outcomes.

Results : 11% of the sample were cognitively impaired; 69% ADHD; 59% Social, 56% Thought, 40% Anxiety, 42% Conduct Problems in the elevated range. The regression for global IQ was significant ($R^2=0.57$; $p=0.024$); only time to adoption contributed variance to the model. Other significant regressions included Thought Problems ($R^2=0.56$; $p=0.01$) and ADHD ($R^2=0.064$; $p=0.007$); age ($p=0.02$) and age ($p=0.01$) and time prior to adoption ($p=0.03$) contributed variance to each model, respectively.

Conclusions: Findings reveal a similar, albeit increased, level of global cognitive impairment and pattern of behavioral problems, as has been reported in institution-reared children. The longer adversity extends the more likely are pathological

outcomes.

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Executive Function profile from young adults with, and without, persistent ADHD symptoms

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Background & Objective: ADHD is an early neurodevelopmental disorder that, in a significant number of cases, persists into adulthood. Lower performance on Executive Function tasks have been reported for adults with ADHD. The aim of this study was to determine whether there are differences in the Executive Functions between young adults with, and without, persistent ADHD symptoms.

Method: Twenty-three young adults (aged 17-21) who were identified 7-8 years ago as ADHD children participated: 6 had persistent ADHD (ADHD-P group), while 17 were in remittance (ADHD-R group) according to the DSM-IV criteria for early adult age. The planning and organization task of the Child Neuropsychological Assessment-ENI (Matute et al., 2007), the Stroop Test, and the Wisconsin Card-Sorting Task (WCST) were administered. Also, parents' BRIEF reports were obtained. Between-groups comparisons were performed with a Mann-Whitney U test.

Results: The ADHD-P group showed a lower number of correct designs using the minimal number of movements on the planning and organization task (ADHD-R: $M=8.770$, $SD=.0783$; ADHD-P: $M=.7727$, $SD=.0954$, $U=21$, $p=.036$), and a lower number of color names on the color-naming section of the Stroop test (ADHD-R: $M=79.12$, $SD=13.10$, ADHD-P: $M=63.17$, $SD=14.74$, $U=20$, $p=.030$). No differences were observed on the WCST. ADHD-P group parents reported higher scores for their offspring on all 9 clinical scales and the 3 BRIEF Indexes.

Conclusion: These data suggest that ADHD-P is associated with an Executive dysfunction in early adults.

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Who receives ongoing care after paediatric mild Traumatic Brain Injury?

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Background and Aims: A large body of research has identified potential risk factors for the development of post-concussive symptoms (PCS) following a mild Traumatic Brain Injury (mTBI) in an effort to enhance clinical management. Although many studies have professed to guide clinical management in mTBI and have made strong recommendations for clinical procedures, none have analysed factors related to ongoing care arrangements made in the Emergency Department (ED). The current study investigates the factors that are being considered by ED clinicians when making ongoing care arrangements of children and adolescents at risk of developing PCS who present to the ED following a mTBI.

Method: The study retrospectively analysed the existing ED database to test the relationship between injury risk factors, non-injury risk factors and ongoing care arrangements of 2807 children and adolescents (0-18 years) who presented to a children's hospital ED.

Results: Univariate analyses indicated a statistically significant association of ongoing care arrangements with age, socio-economic status, mechanism of injury and vomiting. However, multivariate analyses indicated vomiting was the only statistically significant risk factor associated with

ongoing care arrangements, when controlling for other risk factors.

Conclusions: The current study suggests that vomiting is the only risk factor for developing PCS that is considered by ED clinicians when arranging ongoing care for children and adolescents with mTBI.

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The potential sensitivity of verbal list learning test in detecting subjective cognitive decline and amnesic mild cognitive impairment

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Background and aims: The definition of subjective cognitive decline (SCD) has remained inconsistent. The issue can be partly attributable to various episodic memory tasks used across the studies. In the present study, we contrasted performances of individuals with SCD, amnesic mild cognitive impairment (aMCI), and dementia with Alzheimer's disease (DAT) on the two types of episodic memory measures that have often been used in the clinical settings.

Method: A total of 104 individuals comprising 4 subject groups, SCD, aMCI-single domain (aMCI-sd), aMCI-multiple domain (aMCI-md), and DAT were recruited in the present study. All participant received two-nature episodic memory tests, story recall and verbal list learning.

Results: Comparing to normative data, individuals with SCD displayed the significantly poor performance of the delayed recall on the verbal list learning test. However, performances of participants with aMCI and DAT on these two types of episodic memory tests were significantly poor.

Conclusions: Based on the present study results, individuals with SCD did evidence impaired memory functioning evaluated by the verbal list learning test. It appears that the appropriacy of conventional definition of memory function in SCD primarily based on story-featured recall measures is disputable. Further investigation on this issue is thus necessary.

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Decoding emotion from abstract art in frontotemporal dementia

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Background and aims: Impaired processing of emotion is a well-recognised feature of frontotemporal lobar degeneration (FTD), particularly the behavioural variant of frontotemporal dementia (bvFTD). However, deficits have been described chiefly for canonical emotions conveyed via biological and social channels such as facial and vocal expressions, and more recently, music. It is not clear whether analogous problems extend to other, more abstract kinds of emotion coding, such as emotions embodied in non-representational art. This is an issue of clinical relevance, in light of recent reports of

enhanced artistic interest and creativity in some patients with FTD. To address this issue, we designed a novel neuropsychological test requiring two-alternative-forced-choice matching of emotional valence between non-representational paintings controlled for perceptual and stylistic characteristics.

Method: The test was administered to a cohort of patients fulfilling consensus criteria for bvFTD ($n = 11$), semantic variant frontotemporal dementia (SD, $n = 7$) and progressive non fluent aphasia (PNFA, $n = 6$), as well as a group of healthy older individuals ($n = 39$).

Results: Overall, patient performance was significantly poorer than that of our control group ($p < .001$) with bvFTD patient's exhibiting the greatest impairment (mean difference = -3.7, $p < .001$), followed by SD (-2.76, $p = .02$), with no significant difference **between PNFA patients and controls.**

Conclusions: The findings suggest a possible basis for differentiating mechanisms of abstract and social emotion decoding in bvFTD. This may indicate a primary deficit in core emotive processing, rather than inefficient integration of social information.

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Symptom Validity Testing based on Visual Associations: Development of the Visual Association Symptom Validity Test (VASVT)

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Background and aims: Response bias is prevalent in clinical neuropsychological examinations, with estimates ranging from 29%-39% depending on setting (Mittenberg et al., 2002). Specific symptom validity tests (SVT) can be to evaluate feigning of symptoms or symptom over reporting. Given the hazards of SVT paradigms being proliferated amongst the general public, there is a continuous need for development of new SVT's. We constructed the Visual Association Symptom Validity test (VASVT).

Methods: This is a cross-sectional study, comparing the VASVT with the Test of Memory Malinger (TOMM) in healthy controls ($n=33$), healthy persons instructed to feign memory impairment ($n=29$) and geriatric patients ($n=11$). The VASVT is modelled after Green's Word Memory test. Test items consist of 24 pairs of line drawings from the Visual Association Test. Immediate recognition, delayed recognition and consistency are effort tests, Paired associates, Free recall and Multiple choice recognition are genuine learning test.

Results: Healthy controls and patients performed very well on effort tests. Persons instructed to feign impairment did worse and made eight times more errors than controls and geriatric patients. Receiver Operator Characteristics analysis of VASVT scores showed excellent sensitivity and specificity (97% - 100%). The TOMM also differentiated very well between groups. The test profile of healthy controls showed good effort and imperfect memory performance as measured with the paired associates sub task. Geriatric memory clinic patient showed few errors on effort subtests and showed a pronounced decline on genuine memory tests. By contrast, simulators showed an overall poor performance on both effort and memory subtests.

Conclusion: The newly constructed VASVT differentiates very well between simulated memory impairment, genuine memory impairment and no impairment. These validity results may be of interest to clinical neuropsychologists looking for new symptom validity tests.

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The Assessment of Depression Inventory (ADI) Dutch Version: First Findings in Normal Controls and Instructed Simulators

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Background: Feigning or over reporting of psychological symptoms is relatively common in patient samples across different settings. Symptom validity questionnaires can be used to detect response bias. However, some of these questionnaires contain quite bizarre or obvious symptom descriptions that may not evoke a positive response from sophisticated malingerers. The ADI (Mogge and Lepage, 2004) is a self-rating depression questionnaire (Dep), and it also contains a symptom validity scale (Mal), a random responding scale (Rd), and a consistency scale (Rel).

Methods: Cross-sectional study comparing ADI test scores across healthy control (N = 27) and instructed simulator (N = 29) groups. Correlational analysis of ADI and similar tests.

Results: ADI depression and malingering subscales are internally consistent measures (Cronbach's alpha = .92, .97). ADI Mal scores almost perfectly separated instructed simulators from the controls. While normal controls hardly ever reported any atypical depression symptom, nearly all of the instructed simulators did, as evidenced by scored ≥ 10 on the Mal scale. Also, ADI Dep was associated with Beck Depression Inventory-II scores ($r = .81$), and ADI Mal correlated .69 with the Structured Inventory Malingered Symptomatology (SIMS). Finally, explorative analysis showed a positive association between ADI Mal scores and feigning of cognitive symptoms as measured by the Visual Association Symptom Validity Test (VASVT) (N = 56). Of those who over report depressive symptoms, 34.4% show response bias on memory tests.

Conclusions: First findings show that the ADI Dutch version discriminates very well between controls and instructed malingerers, and that its subscales are associated with other scales with similar content validity. This relatively new questionnaire expands the existing array of symptom validity tests, and at the same time it provides the clinical neuropsychologist with a valid, subtle, and not too obvious measure of over reporting of depressive symptomatology.

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Neuropsychological patterns of impairment in Parkinson's Disease patients in Singapore

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Background and aims:

There are inconsistent findings of neuropsychological profile in Parkinson's Disease (PD) in western population studies, while studies of neuropsychological patterns of PD in Asian patients are scarce. We aimed to compare the global and specific cognitive domain performance of cognitive impairment in PD patients to cognitively healthy PD free controls.

Method: 73 idiopathic PD patients and 48 non-demented healthy controls were recruited from National University Health System in Singapore. All participants received brief

cognitive screening tests, the MMSE and the MoCA, underwent a formal neuropsychological evaluation and a mood assessment [Geriatric Depression Scale (GDS)]. Severity of PD was measured using the Unified Parkinson's Disease Rating Scale (UPDRS), Hoehn and Yahr (HY) stage and Schwab and England Activities of Daily Living Scale (SE Scale). The mean z score of the neuropsychological performance of PD patients was compared with that of healthy controls using the Analysis of covariance (ANCOVA) and Multivariate analysis of covariance (MANCOVA).

Results: PD patients and controls were comparable in age, gender and education. PD group had significantly more patients of non-Chinese ethnicity and self-reported depressive symptoms than controls. Controlling for ethnicity and GDS, PD patients performed significantly worse on global cognitive composite and multiple cognitive domains than the controls (global cognitive composite: -1.63 ± 1.57 vs 0 ± 1 , $p = 0.002$; executive function: -1.84 ± 1.85 vs 0 ± 1 , $p < 0.001$; visuomotor speed: -1.23 ± 0.99 vs 0 ± 1 , $p < 0.001$; memory: -1.23 ± 1.04 vs 0 ± 1 , $p = 0.001$; visuospatial function: -1.65 ± 1.69 vs 0 ± 1 , $p = 0.002$). Executive function deficits was most frequent (42.6%), followed by deficits in visuomotor speed (23%), visuospatial function (23%) and memory (16.4%).

Conclusions: Consistent with the subcortical aetiology of PD, the neuropsychological patterns of impairment of PD patients is characterized by a profile of deficits of executive function, visuomotor speed, visuospatial function and memory while deficits in attention and language are less pronounced.

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Overprotectiveness of elderly Singaporeans with mild cognitive impairment by their informal caregivers

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Background and aims: Elderly diagnosed with mild cognitive impairment (MCI) are still able to independently perform their instrumental activities of daily living (iADLs). However, their caregivers may be overprotective, and adopt behaviours to assist them with performing their iADLs despite reporting no decline in their ability to function independently. This study investigates the types of overprotective behaviours, and the reasons for the assistance, among caregivers of Singaporean patients diagnosed with MCI.

Method: Using a semi-structured interview, 16 caregivers of MCI patients were asked whether there has been a deterioration in the patient's ability to perform any of the following 10 iADLs due to cognitive difficulties: (i) keeping appointments, (ii) going shopping and purchasing items, (iii) financial management, (iv) household chores, (v) food preparation, (vi) taking medication, (vii) use of transportation, (viii) use of familiar and (ix) new technology, and (x) participation in religious and social activities. For each domain, they were asked to describe any assistance they provide the patient, if any, and to give reasons for their assistance. Content analysis was used to identify the responses provided by the caregivers, and after collapsing the categories across the 12 tasks, frequency analysis was performed to quantify the number of such responses in the sample.

Results: Overprotective caregiving behaviours were found for 9 of the 10 iADLs; caregivers did not appear to assist patients with familiar technology. They were more likely to offer assistance for activities they thought to be vital for the patient's well-being such as keeping appointment and assisting with shopping. For each of the domains, there was variability in the degree of assistance provided, which

appeared to be a reflection of one or more of the following reasons: (i) fear for the safety and well-being of the patient given the diagnosis of cognitive impairment, (ii) convenience and (iii) obligation as a family member.

Conclusions: Caregivers adopt overprotective behaviours that revolve around their own feelings of fear and obligation, concern for the patient's well-being, as well as out of convenience. As overprotective behaviours have been shown to hasten functional decline among patients, it is important to recognize and advise these caregivers against adopting such practices in order to facilitate and prolong independence among elderly MCI patients

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Comparing online versus face-to-face delivery of an aphasia conversation partner training program for healthcare professionals: A pilot randomised controlled trial

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Background and aims: Healthcare services are largely, if not entirely, mediated by communication. People with aphasia can experience significant communication breakdown during conversation, which may lead to an inability to fully access available healthcare services. Training conversation partners to use facilitative communication strategies is one method that can improve access to healthcare for people with aphasia by enhancing the communicative environment. However, the efficacy of this training has only been investigated in the context of face-to-face delivery. Other modes of delivery, such as online training, can offer more cost effective and accessible options. Therefore, the present pilot randomised controlled trial aimed to compare the outcomes of an aphasia conversation partner training program (CPTP) that was delivered in face-to-face lecture format or as an online module.

Method: Thirty first-year undergraduates studying occupational therapy at The University of Sydney were randomly allocated to one of three training groups: face-to-face, online, or (delayed training) control. The aphasia CPTP delivered was developed using the theories and techniques of Supported Conversation for Adults with Aphasia (SCA™). The primary outcome measures from the aphasia CPTP were: 1) knowledge of aphasia-relevant information; 2) knowledge of communication strategies; and 3) attitudes toward speaking with a person affected by aphasia. Improvement in these three outcome measures was calculated using pre- and post-intervention responses to surveys based on the aphasia CPTP.

Results: The face-to-face and online training groups significantly improved in all three outcome measures ($p < .001$); however, the control group did not ($p > .05$).

Furthermore, there was no significant difference in improvement between the face-to-face and online training groups ($p > .05$).

Conclusions: In this study, online training proved to be equally as effective as face-to-face training and thus is a viable mode of delivery for future aphasia CPTPs. Therefore, these pilot results pave the way for the design and completion of a future larger study that will comprehensively evaluate the efficacy of the aphasia CPTP.

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Success of behavioral interventions for individuals with mild cognitive impairment and their caregivers may be related to sex differences

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Background and objectives: Caregivers (CG) of those with mild cognitive impairment (MCI) experience significant distress, new-onset health comorbidities, and decreased quality of life (QOL), which may be particularly salient for women as they are more frequently the CG. The aims of this project were to determine the impact of participation in a multicomponent memory compensation program (HABIT Healthy Action to Benefit Independence & Thinking) and assess sex differences on neurobehavioral outcomes.

Method: Measures of mood, self-efficacy, memory-related activities of daily living (ADLs), burden, coping, and QOL were collected from 113 MCI patients and their CG prior to and 3 months after HABIT intervention. These same data were collected from 47 MCI/CG Control dyads (no intervention) at "baseline" and 3 months later. Slopes of change were examined.

Results: Sex distribution (44% vs 36% female), age (73.9 vs 73.8), and education (16.0 vs 16.2) did not differ for HABIT vs Control MCI or HABIT vs Control CG (66% and 70% female, 70.5 vs 69.0, 16.4 vs 15.9). Statistically significant slopes of change were observed for MCI HABIT females, who reported less depression ($p < .001$) and greater QOL ($p = .002$). MCI HABIT males reported improved QOL ($p < .001$) and ADLs ($p = .04$). MCI Controls reported no change. HABIT female CG reported decreased burden ($p = .04$), depression (.02), and anxiety ($p < .01$), and improved coping ($p = .02$). HABIT male CG reported decreased anxiety ($p = .02$). Female CG Controls reported no change, and male CG Controls reported increased anxiety ($p < .05$).

Conclusions: Behavioral interventions improve neurobehavioral outcomes, apparently more so for women than men. Factors underlying this observation warrant examination in order to optimize outcomes for all. Women live longer, are more often CG, and are therefore at heightened risk of health issues related to disease burden and caregiver stress, underscoring the importance of early intervention, particularly in this population.

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Factors influencing instrumental activities of daily living in patients with mild-stage Alzheimer's disease

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Background and aims: Patients with mild Alzheimer's disease (AD) have difficulty in performing instrumental activities of daily living (IADL). We determined indices predictive of IADL, in terms of cognitive, psychological, and physical functioning, in patients with mild AD.

Method: Subjects included 67 individuals, including those without dementia and patients with mild AD. We used the Frenchay Activities Index (FAI), which includes three factors (i.e., domestic chores, F1; leisure/work, F2; and outdoor activities, F3) to determine subjects' IADL performance. In addition, we used the Timed Up and Go Test (TUG) to gauge physical balance ability, the Geriatric Depression Scale (GDS) to assess depression, the Behavioural Assessment of the Dysexecutive Syndrome (BADS) to evaluate executive function, the Clock Drawing Test to assess visuospatial-constructive function, and the revised Wechsler Memory Scale (WMS-R) to assess memory. We used multiple regression for data analysis in order to determine the cognitive function, physical function, and emotional indices predictive of performance on the FAI's F1–F3 categories of functioning ($p < 0.25$).

Results: The two factors that best predicted the three FAI categories of functioning that we examined (i.e., F1–F3) were the WMS-R and TUG scores. In addition, the factors predictive of F2 and F3 performance were the Clock Drawing Test and BADS scores.

Discussion: The results of this study indicate that the predictive usefulness of different physical function/cognitive function/emotional indices varies depending on the type of IADL being assessed.

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Promoting cognitive health in adults at risk of dementia: A Life-style intervention program

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Background and aims: With the ageing population, there is increasing individual concern about cognitive decline in late life and the development of dementia. Epidemiological evidence that many lifestyle factors increase dementia risk has prompted trials to prevent age-related decline and dementia by modifying such factors. The emphasis has been, in particular on mental, social and physical activities, vascular risk factors such as hypertension, diabetes, smoking, inactivity and obesity, and nutritional factors. The prevention of dementia therefore warrants the modification of lifestyle, and is likely to be effective only if it is tailored to individual needs. The aim of this study was two-fold. First to explore the practical application of individually tailored lifestyle intervention in a small community based private practice, and second to monitor the improved outcomes of modifying behaviour and increasing emotional wellbeing.

Method: Clinical case studies drawn from consecutive referrals of adults who had been independently diagnosed with Mild Cognitive Impairment (MCI) over a 2 month period in 2014. Baseline and follow-up assessment of subjective psychological status, leisure activities and social engagement. Combination of data from single cases to provide a quantitative and qualitative summary of intervention content, obstacles to implementation, and intervention outcomes.

Results: Five referrals were received providing four eligible candidates (mean age 58 years). All candidates were tertiary educated professionals who had ceased employment due to MCI within previous twelve months of referral. Importantly at some stage of the investigation process, each candidate had been informed that there was nothing they could do to improve their cognitive health. Number of sessions ranged from 4 to 10, with carer support being associated with fewer sessions. Each candidate successfully completed their program, with an average of 3 behaviour targets, and all experienced improved emotional health. Psycho-education, goal setting and motivational interviewing were necessary in all cases.

Conclusions: Individually tailored life-style intervention is effective in reducing dementia-risk behaviours and increasing leisure activity levels and psychological wellbeing. Psycho-education and motivational interviewing is necessary for effective behavioural change and supportive input from family appears crucial for efficiency.

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Protocol and preliminary findings of a multi-centre randomised controlled feasibility study of an Arts for Health group (“HeART of Stroke”, HoS) to support self-confidence and well-being following stroke

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Background and aims: Low mood affects a third of stroke survivors. Evidence for, and provision of psychological support is poor, especially for those with aphasia. Arts-based approaches enable those with communication barriers to express themselves. This study investigates the feasibility of conducting a randomised controlled trial to evaluate an Arts-based group intervention (HeART of Stroke, HoS) for stroke survivors.

Methods and Analysis: 64 people <2 years post-stroke, without pre-stroke psychiatric history, identified from stroke services across 2 sites will be recruited, and randomised to HoS plus usual care (UC) or UC only, stratified by stroke severity. HoS is a community-based, supportive, artist-facilitated group (6-8 people) of 10 sessions run over 14 weeks. Outcomes (well-being, mood, quality of life) will be collected before, and 4 months following randomisation, and summarised (means (SDs) 95% CIs). Health economic measures (e.g. medication, service use, intervention costs) will be piloted, process information (e.g. recruitment, attrition, questionnaire completion) collected and acceptability established through participant interviews.

Results: 16 participants have been recruited (12 men; 4 women) and randomised to HoS plus UC or UC only, mean age 72 years (range 46-87, SD 11.64), 15 mild and 1 moderate/severe stroke severity; recruitment rate 10% (95% CI: 5%, 15%); 4 withdrew. Preliminary findings suggest the HoS intervention is well received.

Conclusions: This study illustrates the potential for an arts-based intervention, accessible to those with or without aphasia post-stroke, to be evaluated systematically. Preliminary data suggest HoS is a promising intervention. Further consideration needs to be given to recruitment strategies.

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Exploratory investigation of the effects of motor symptoms on the assessment of mood in Parkinson’s disease

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Background and aims: Anxiety and depression are common in people with Parkinson’s disease (PD) however overlap with motor symptoms means accurate assessment can be difficult. The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) has been useful in detecting anxiety and depression in PD (Bjelland et al., 2002), although more recent research questions this (Leentjens et al, 2008). This exploratory study examined current level motor functioning and side of motor symptom onset on the two-factor HADS model, and a three-factor model that included a psychomotor scale.

Method: Participants ($n=62$) were divided into higher and lower motor functioning groups, and into three groups (right, left, bilateral) for side of onset. Materials included the HADS, hand dynamometer (Dodrill, 1978), Finger Tapping Test (Reitan & Wolfson, 1983), and Speed of Information Processing subtest (Coughlan, Oddy, & Crawford, 2007). The

HADS was scored using the two-factor and three-factor models (Skilbeck et al., 2011). This quasi-experimental design used t-tests, ANOVAs, and Tukey's HSD post-hoc tests for analysis. Cohen's *d* was used to determine effect sizes.

Results: The two-factor HADS showed no significant effect of motor functioning on anxiety or depression. The three-factor HADS indicated a significant between-groups difference for the psychomotor factor, with the lower motor functioning group reporting significantly more symptoms ($p < .05$). One-way ANOVAs examined the differences for side of onset on the two-factor and three-factor HADS models. Significant differences were found for both for anxiety and depression symptoms ($p < .05$), but not for psychomotor symptoms.

Conclusions: Motor symptom presentation is important in HADS responding. Results caution against reliance on the two-factor HADS for mood assessment in PD. Results also suggest a three-factor model of the HADS may distinguish between higher and lower motor functioning groups.

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Effects of moderate aerobic exercise on cognitive function and cerebral blood flow

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Background and Objectives Aerobic exercise improves cognitive function. Also the cerebral blood flow in the prefrontal area is known to increase when tested with Stroop tasks following moderate aerobic exercise. This study was to determine the required optimum intensity for moderate aerobic exercise to increase mental alertness and cerebral blood flow.

Methods Six women and one man aged 20-30 years underwent VO_2max testing to determine the required intensity. Three experimental conditions were devised: a) 15-min exercise period on a bicycle ergometer at an intensity of 40% of VO_2max ; b) same as a) but at an intensity of 60% of VO_2max ; and c) 15-min resting condition. Each participant underwent the three conditions randomly at intervals of three to seven days. The attentional control of the participants was measured by the Paced Auditory Serial Addition Test (PASAT) and their cerebral blood flow of the left prefrontal and temporal cortices by near-infrared spectroscopy. Comparisons were made between the pre-/post-exercise PASAT scores and cerebral blood flow of the participants for all three experimental conditions. All of the participants provided written informed consent that was approved by the Institutional Review Board of the University of Kanazawa.

Results The participants who underwent 60% VO_2max condition achieved significantly correct PASAT answers post-exercise compared to pre-exercise testing. However, for a) and c) conditions, the cerebral blood flow in the prefrontal and temporal cortices significantly decreased on post-testing.

Conclusion An intensity of 60% VO_2max during moderate aerobic exercise may enhance cognitive function through increased blood flow and mental alertness.

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Relationship between Odor Identification and Cognitive Functions in Healthy Aged People

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Background and aims: Empirical evidence demonstrates a relationship between olfactory dysfunction and cognitive decline. The purpose of this study was to examine the validity of proposals (memory function decline and attention-executive function decline) concerning to the neural mechanisms underlying this relationship,

Methods: We examined Odor Stick Identification test as well as cognitive test performances (Digit cancellation test, Logical memory test, and Money road test) for the sample of 248 community-dwelling healthy Japanese participants (mean age was 64.3 years, ranged from 40 to 87) as a part of the Yakumo study.

Results: Comparisons of olfactory and cognitive test performance showed the relationship between olfactory and cognitive decline. Especially, cognitive performances that relate to attention, executive and perceptual speed-related functioning showed a stronger association with olfactory deficits with aging than performances that are responsible for memory and visuospatial performances.

Conclusions: As for the underlying neural mechanisms to explain the relationship between olfactory and cognitive decline, it might be considered that age-related olfactory impairment might be associated with prefrontal lobe dysfunction and associated age-related neural network dysfunction.

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Kanji character recall in Japanese patients with mild cognitive impairments and mild Alzheimer's disease

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Background and aims: To investigate Kanji character recall, we administered Kanji character fluency, verbal fluency, and Kanji dictation task to patients with amnesic mild cognitive impairments (aMCI), patients with mild Alzheimer's disease (AD), and normal controls (NC).

Method: Twenty-five aMCI patients, 38 AD patients, and 22 NC performed following tasks: 1) Kanji character fluencies: writing as many characters as possible with a given radical, and with a given sound, 2) semantic and phonetic verbal fluencies, and 3) Kanji dictation task: 50 two-character words (numbers of non-response errors were calculated). Analysis of

valiance was used to test the group effects on the scores of above tasks. For the aMCI and AD patients, multiple regression analysis was performed to examine relationships between all tasks.

Results: The effects of the groups in all tasks were significant ($p < 0.01$). Post-hoc analyses (Tukey's test) showed that the performances in the semantic verbal fluency and the Kanji character fluency (sound) differed significantly between all groups. There were significant differences between the groups (aMCI > AD, NC > AD) in the Kanji character fluency (radical). In the phonetic verbal fluency and Kanji dictation task, the AD group significantly differed from the NC group. Multiple regression analysis showed Kanji character fluencies were associated with the phonetic verbal fluency and the numbers of non-responses.

Conclusions: Our findings suggested that the performance in the Kanji character fluency as well as verbal fluencies could differentiate aMCI from controls. Kanji character fluency seems to be related to phonetic verbal fluency and retrieval of Kanji characters.

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T-tau is associated with objective memory decline over 2 years in persons seeking help for subjective cognitive decline. A report from the Gothenburg-Oslo MCI study

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Background: The present study aimed to address the potential relation between CSF biomarkers and reduced cognitive function in a relatively young cohort of memory clinic patients with subjective cognitive decline (SCD).

Methods: 122 patients (mean age 63 years) with SCD were recruited from two university memory clinics and followed for 2 years.

Results: The general trend was improved memory and executive test scores. There were no differences in cognitive scores based on CSF quartiles at baseline, nor were there differences in cognitive outcome for patients with early amnesic MCI (EMCI) versus average cognitive function at baseline. The main finding was that the subgroup with memory decline during the study period had significantly higher T-tau at baseline than the group with improved memory. Baseline CSF variables showed a trend towards more pathological values in the patients that declined with regard to memory compared to those who improved or remained stable. The baseline memory score of those who declined was significantly better than the baseline score of those who improved over two years. **Conclusions:** The biomarker findings do not support the prevailing opinion about the chain of events assumed to take place in Alzheimer's disease. In addition, decline in memory was not associated with poor baseline memory score. Thus, a memory cut-off indicating low baseline memory, would not would have identified the declining group.

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Augmentative and Alternative Communication (AAC) using Information and Communication Technology (ICT) which are available for the patients with aphasia and higher brain function disorders

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Background and Aims: The purpose of this study was to consider that any AAC using ICT might support the communication for the patients with aphasia and higher brain function disorders. The progress and the spread of ICT are so remarkable in recent years that the communication tools which are available for such patients may be found more easily than before. We reported one patient who was suffering from aphasia and higher brain function disorders caused by intracerebral hemorrhage for the purpose of this study. Though the symptom of dysgraphia and dyslexia was especially severe, she took back the ability to send and read emails.

Case: The patient was a female 60-year-old at the onset of disease. The head MRI, 1 month after the onset of disease, showed a lesion with high intensity signal in the cortical and subcortical region of the left tempo-parietal lobe. At the onset of the disease she had a mild right hemiparesis that later disappeared. She suffered from a fluent aphasia complicated by so-called Gerstmann syndrome and some other higher brain disorders. The result of the Raven's Coloured Progressive Matrices was 13/36. The symptom of dysgraphia and dyslexia was so severe that she could not read or write even her own name.

Results: 4 months after the onset of disease, she desired to send emails to her friends who had lost contact for these months. Speech-language-hearing-therapists and a system engineer considered how to send and read emails compensating for her dysgraphia and dyslexia, and instructed her to do it. 6 months after the onset, she took back the ability to send and read even long emails, and further to search information on the net using her smartphone. 12 months after the onset, she came to enjoy going out using the net for searching information freely, write short letters by hand, and enjoy reading short poems.

Conclusions: AAC using ICT extended her activities, and consequently the writing and reading impairment recovered.

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Improving access to assessment services for rural children using videoconference technology

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Background and Objectives: Children with language difficulties living in rural areas are disadvantaged by their relative lack of access to speech pathologists. Telehealth is an effective way of providing intervention for speech and language issues but the use of this technology for remote assessments has yet to be established. We examined the feasibility and reliability of conducting language assessments in school-aged children with complex reading difficulties via telehealth.

Method: Twenty-three students who attended one of The NSW Centre for Effective Reading rural hubs between July and December 2014 took part. A speech pathologist based in Sydney used standard computer equipment with a web application developed by National Information Communication Technology Australia to deliver the Clinical Evaluation of Language Fundamentals-4th edition to remote students. A second speech pathologist in the same location as the student co-scored the subtests and facilitated the assessment. The local speech pathologists also completed other assessments face to face. Behaviour observations, child and parent feedback were obtained.

Results: There was high inter-rater reliability ($r = 0.97 - 0.99$) and children were equally attentive and compliant in both remote and face to face conditions. Clinicians rated the audio and video quality as 'good'. Parent and child reactions to the use of telehealth were largely positive.

Conclusions: Telehealth assessments of school aged children are feasible and reliable using standard computer equipment in a real-world setting. This innovative service delivery model has the potential to be used not only by speech pathologists but also neuropsychologists to provide assessments to children in remote communities.

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Improving access to assessment services for rural children using videoconference technology

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The Bayley Scales III: A performance comparison of Australian 12 month-old children with the United States normative sample

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Background and Aims: The Bayley Scales of Infant and Toddler Development- Third Edition (BSID-III) is the gold standard developmental assessment tool in Australia. As Australian normative data does not exist, clinicians and

researchers currently rely on United States (US) data for interpretation of developmental results. However, whilst the directionality remains unclear, research suggests the use of US normative data may lead to misinterpretation of developmental outcomes. Demographic factors such as cultural, linguistic and economic characteristics may contribute to variations in infant outcomes across countries. As a result, potential misdiagnosis poses a significant public health risk. Therefore, the current study aims to examine how a large cohort of 12-month-old Australian singleton children perform on the BSID-III when compared to the US normative sample.

Method: 381 families were recruited through general antenatal services in New South Wales, Australia. Women were interviewed during their pregnancy and 8-weeks post-natally. At 12-months the BSID-III was administered, which comprises of clinician based assessment of cognition, language and motor development, and parent rated social-emotional functioning and adaptive behaviour.

Results: Results of independent sample t-tests suggest that the current cohort performed significantly higher than the US normative sample in the fine motor and cognitive domains. Conversely, the current sample performed significantly lower than the US normative sample in the gross motor domain. No significant difference was found between the current sample and the US normative sample in the expressive or receptive language domains.

Conclusions: The results obtained present significant clinical implications for early diagnosis and intervention of developmental conditions in Australia. The results of this study warrant the development of Australian normative data for the BSID-III.

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The evolution of carer burden in frontotemporal dementia with and without motor neuron disease

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Background and aims: Frontotemporal dementia (FTD) and motor neuron disease (MND) fall within the same disease spectrum. Carer burden in FTD subtypes (behavioural-variant FTD and semantic-variant primary progressive aphasia) has not yet been directly compared with that of patients who also have the adjunct diagnosis of MND (FTD-MND). The evolution of burden with disease progression may also differ across these syndromes.

Method: Perceived carer burden was evaluated using the Zarit Burden Interview (ZBI) in patients with bvFTD (n=21), svPPA (n=18) and FTD-MND (n=15) at the initial clinical presentation and follow-up assessments. The Mini-Addenbrooke's Cognitive Examination (M-ACE) and the Motor Neuron Disease Behaviour Scale (MiND-B) were also used. Linear mixed effects models examined longitudinal changes on the ZBI, M-ACE and MiND-B across groups.

Results: Burden at baseline was highest for the bvFTD group. Longitudinally, perceived burden increased for the svPPA and FTD-MND groups whereas in bvFTD, the level of burden was high at baseline and remained high with disease progression. Significant time x diagnosis interactions was not obtained for

the M-ACE or MiND-B. The severity of abnormal behaviours (MiND-B) at baseline significantly correlated with baseline levels of carer burden and furthermore, accounted for a fifth (23%) of the variance in carer burden at the first clinical follow-up.

Conclusions: The trajectory of perceived burden differs across bvFTD, svPPA and FTD-MND. Levels of burden increase for svPPA and FTD-MND whereas it remains high for bvFTD carers. The evolution of burden in these three syndromes may be a reflection of the way in which these syndromes are clinically characterized for the carer. Moreover, psycho-education programs for carers which provide better coping strategies for challenging behaviours may reduce levels of burden experienced with disease progression.

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Loss of empathy across the amyotrophic lateral sclerosis - frontotemporal dementia spectrum

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Background and aims: Frontotemporal dementia (FTD) and amyotrophic lateral sclerosis (ALS) exist within the same disease spectrum. Loss of empathy is a prominent feature of behavioural-variant FTD (bvFTD) and has been described in ALS. Direct comparisons of empathy loss between these groups have not yet been investigated. Furthermore, its association with carer burden is unclear.

Method: Empathy loss was evaluated using the Interpersonal Reactivity Index (IRI) in patients with bvFTD (n=17) and ALS (N=52). ALS patients were further classified into those with frontotemporal dementia (ALSFTD; n=15), with subtle cognitive and behavioural problems (ALS plus; n=11) and with motor symptoms only (ALS pure; n=26), according to current guidelines. The brief Zarit Burden Interview was used to evaluate carer burden.

Results: Rasch analysis of IRI items showed a gradient of empathy loss with impairment greatest for bvFTD, intermediate for ALSFTD and was least affected in ALS patients without dementia. Interestingly, a proportion of ALS patients without dementia (ALS pure and ALS plus; 4/37 or 11%) were rated by their partners to show striking empathy loss. Carer burden was differentially associated with socioemotional in ALS: loss in perspective taking was associated with increased burden in ALS without dementia whereas a lack of emotional warmth elevated carer burden in ALSFTD.

Conclusions: Empathy loss across the ALS and FTD spectrum is graded with impairment greatest for bvFTD in comparison to ALS although a proportion of ALS patients without dementia showed striking loss of empathy. These findings might be explained by progression of atrophy in regions known to be important for empathy and social behaviour. The finding that carer burden was associated with differing aspects of empathy loss across ALS groups has important implications for the planning and delivery of services in ALS patient care.

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Not Motivational Reserve but Cognitive Reserve Acts as a Buffer of Cognitive Decline

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Background and aims: There is epidemiological evidence that lifestyle characterized by engagement in leisure activities of intellectual and social nature is associated with slower cognitive decline in healthy elderly. We reported that the use of information technology was associated with the maintenance of cognitive functions more than cognitively stimulating activities. In the present study we investigate whether the use of information technology itself or motivation for the acquisition of new skills contributes to cognitive reserve.

Method: Participants were 376 community-dwelling middle aged and older persons without dementia. They were assessed for frequencies of lifestyle activities and motivation for new skills in the original questionnaire. The cognitive functions were measured by means of logical memory test, Money road test, Stroop test, D-CAT (digit cancellation test) and verbal fluency test.

Results: We constructed a series of linear regression models to examine the association of lifestyle factors (cognitively stimulating activities, the use of information technology and motivation for the acquisition of new skills) with cognitive functions. In analyses controlling for age, sex, and education, more frequent cognitive activity was related to better performance in D-CAT, logical memory test and verbal fluency test. In addition, more frequent use of information technology was related to better performance in Stroop test and Money road test. However, motivation was not associated with cognitive functions.

Conclusions: The results suggest that not motivation but the adoption of new technology contributes to slower decline of cognitive functions. Our study confirmed that cognitively stimulating activities played a role in a buffer of cognitive decline in aging.

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Neuropsychological Aspects of Creutzfeldt-Jakob Disease

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Objective: The diagnosis of Creutzfeldt-Jakob disease (CJD) is based on the combination of fast progressing dementia with other neurological symptoms. Although dementia is a main symptom of CJD, there are no available results of prospective monitoring of neuropsychological aspects of patients with CJD in the literature. The aim of this study is to analyze cognitive-behavioral symptoms in patients with post-mortem confirmed CJD.

Participants and Methods: 18 patients with post-mortem confirmed diagnosis of CJD were included in this study. Average age was 62,6 years (52-76 years). 16 patients had sporadic form and one patient had genetic CJD with R208H PRNP mutation. Clinical data and results of

neuropsychological assessments were analysed retrospectively.

Results: All patients suffered from cognitive deficits with frontal traits and alteration of executive and language functions. Mnestic and visuospatial functions were also affected. The most frequent neuropsychiatric symptoms were depression, apathy, irritability, anxiety and insomnia. Bradypsychia, perseveration, grasping, utilization were frequently found among the patients.

Conclusions: Early detection of prion disease is very important for the patients and their families. As there is no causal therapy, it is important to protect the patient from undergoing further useless and often uncomfortable examinations and to begin with palliative care as soon as possible.

In the wider context the gained data could help to assist in developing new neuropsychological testing methods.

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Comprehension and production of pragmatic prosody in individuals with Williams syndrome

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Background and objectives: Rate and intonation of prosody can serve a pragmatic role. Typically developing children show a developmental improvement in the comprehension and production of pragmatic prosody. The current study investigates the comprehension and production of pragmatic prosody in individuals with Williams syndrome (WS), a neurodevelopmental disorder. Individuals with WS display relative strengths in certain aspects of language, but little is known about their prosodic processing skills.

Method: In Experiment One (Comprehension), 22 children with WS were asked to choose between two images (a fast or slow moving star) based only on hearing the items described in either a fast or slow rate of speech. In Experiment Two (Production), 25 children with WS (not involved in Exp. 1) described a star that was moving slowly or quickly toward a target animal (cat/dog).

Results: In the Comprehension experiment, the participants accurately used prosodic rate to choose the star on 71.7% of the trials. Thirty-two percent (32%) of the participants were able to accurately choose either the slow or fast moving star on 97-100% of the trials, while 36% of the participants scored at chance or below. Chronological age and verbal mental age showed a modest correlation with accuracy rates ($r = .38, p \leq .08$). The results of the Production experiment indicated that the participants spoke more slowly when describing the slow vs. fast star ($p = .007$). Age analyses showed no significant difference between the production rate of fast and slow trials for 7-8-yr-olds, while there was a significant difference for the 9-12-yr-olds ($p = .04$). Correlations between Verbal MA and speech rate were not significant.

Conclusions: The evidence suggests that children with WS do develop prosodic production and comprehension skills, albeit delayed compared to typically-developing children. Prosody training may improve their speech/language outcomes, and may extend to those with other developmental disabilities.

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Investigation into the adaptive behavior, developmental, and cognitive phenotype of infants and toddlers with Williams syndrome

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Background and objectives: Williams syndrome (WS) is a neurodevelopmental disorder that causes cardiac abnormalities, difficulties eating and sleeping, cognitive delays, anxiety, and hypersociability. Although researchers have done phenotypic analyses of children and adults with WS, less is known about the infant and toddler population. This study characterized the adaptive behavior, developmental, and cognitive features of infants and children with WS aged 0-5 years.

Method: Data was obtained from 17 infants and toddlers who came to the Nationwide Children's Hospital/Nisonger Center Williams Syndrome Clinic, including parent reported developmental history, medical data, and scores from the Adaptive Behavior Assessment System, 2nd Ed. and the Bayley Scales of Infant and Toddler Development.

Results: Thirty-seven percent (37%) of parents reported that their infant/toddler with WS had sleeping problems, 50% reported feeding difficulties, and 28% reported that their child needed a special diet. Delays were noted in the acquisition of developmental milestones, particularly in language development. Levels of adaptive behavior were in the Mildly Delayed range ($M = 60.47, SD = 10.60$), with a relative strength in the Social Domain, and a relative weakness in the Practical Domain. A significant main effect was noted between the skill areas within the Practical domain (Home Living, Community Use, Health and Safety, Self Care) [$F = 10.43, p = .003, \eta p^2 = .77$], with scores in Community Use significantly higher than scores in Self Care [$p = .004$]. A significant main effect was also found between the three composite scores on the Bayley Scales (Motor, Cognitive, and Language), with lower scores appearing in the Cognitive Domain [$p = .037; \eta p^2 = .40$].

Conclusions: The data highlights the need for continued early intervention in young children with WS, particularly to improve outcomes in the adaptive skill areas of Home/Community Living, Health & Safety, and Self-Care.

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Long-term memory in ADHD children

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Objective: The goal of this research was to examine the hypothesis that children with ADHD have a weakness in long-term memory.

Methods: The experimental group included 14 Russian-speaking children with ADHD at age 7-9-years. The control group included 14 typically developing children. The children from experimental and control group were matched for IQ, gender and age.

Children from both groups were assessed with NEPSY using Memory for Faces subtest. This subtest is designed to assess the ability to learn the faces. A delayed task assesses long-term memory for faces. Two-way ANOVA was used to reveal group differences in reproducing the faces in immediate and delayed conditions.

Results: We have not revealed significant differences between children from experimental and control group in the recalling the faces in immediate condition.

However, the interaction of condition type and group was significant. ADHD children were less successful in recalling the names in delayed condition.

Conclusion: Children with ADHD have weakness in long-term memory for faces.

In view of the obtained results, it can be assumed that children with ADHD have specific deficit in the long-term memory.

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Detecting cognitive fatigue in adolescents with chronic fatigue syndrome: Piloting a novel paradigm

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Background and Objectives: Chronic fatigue syndrome/myalgic encephalomyelitis (CFS/ME) is associated with persistent, debilitating fatigue together with a range of other symptoms. Almost all adolescents diagnosed with CFS/ME report cognitive difficulties; however, cognitive function in adolescents with CFS/ME has seldom been objectively measured. This novel pilot study compared cognitive performance at the beginning and end of a period of cognitive exertion in adolescents with CFS/ME.

Method: Eleven adolescents (mean age: 15 years) diagnosed with CFS/ME completed a 20-minute, computerised, CogState Research battery assessing simple reaction time, sustained attention, working memory and new learning, before and after a 30-minute academic assessment (WIAT-II Abbreviated). Subjective measures of fatigue were also administered before and after the period of cognitive exertion.

Results: Adolescents with CFS/ME reported higher levels of subjective fatigue following a period of cognitive exertion. Mean performance on all cognitive tasks fell within the age-expected range pre-cognitive exertion. From pre- to post-cognitive exertion, mean performances on tasks of reaction time and sustained attention declined significantly ($p < .01$). In contrast, performances on working memory and new learning tasks remained relatively stable over time.

Conclusions: These preliminary results suggest that while adolescents with CFS/ME display generally age-appropriate cognitive abilities, the speed at which they can process information and their capacity to sustain their attention declines following a period of cognitive exertion. Further research with larger numbers and a healthy control group is required to confirm whether this decline over time is specific to CFS/ME.

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Age-related mammillary bodies atrophy and memory characteristics in healthy people

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Background and aims: Studies of patients with Korsakoff's syndrome revealed that memory deficits occur along with mammillary bodies atrophy (Harding et al., 2000; Vann&Aggleton, 2004). In present study we explore the

relations between age-related mammillary bodies atrophy and memory characteristics in healthy people.

Method: 15 healthy right-handed females (60-76 years old) participated in the study. Visual and verbal working memory capacity and permanency were evaluated with Luria's neuropsychological tests modified by J.M. Glzman (1999). Structural magnetic resonance images were obtained on 3T MRI scanner for each subject. Based on visual analysis, we highlighted both mammillary bodies, and calculated their volumes (in mm³), we also calculated the asymmetry coefficient (the ratio of the volume of the right mammillary body to the left). We calculated non-parametric correlations between individual working memory characteristics and morphometric data.

Results: The volume of the right mammillary body correlates significantly with visual working memory permanency ($R = 0.54$, $p < 0.01$). Verbal working memory capacity correlates positively with the asymmetry coefficient of mammillary bodies ($R = 0.66$, $p < 0.05$). Therefore, higher volume of left mammillary body in comparison with the right one is related to better verbal memory capacity.

Conclusions: The study revealed correlation between age-related mammillary bodies atrophy and working memory decline. Furthermore, the results show functional asymmetry of this structure. Right mammillary body is mainly related to visual memory and the left one - with verbal memory.

The study is partially funded by RHSF project # 13-06-00570.

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A method for early detection of the risk of cognitive impairments

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Background and aims: Brain energy supply (consumption of oxygen, glucose, etc.) is realized by local (up to the individual neuronal columns) capillary vascular regulation. These processes are reflected in a BOLD-fMRI signal and estimate the "load" of the respective brain locus by a cognitive task. Cerebrovascular reactivity (CR) is a sensitive biomarker for cerebrovascular diseases, leading to a functional disorder of this brain area and to cognitive impairments possible to predict.

Method: Evaluation of local brain CR with fMRI using the standard technique of registration of BOLD-signal changes during hyperventilation.

Results: We developed a method for early detection of neurocognitive disorders risks in humans, through fMRI measurement of local brain CR. Local changes in BOLD-signal during lungs hyperventilation ("test") compared to the calm state ("background"), without performing any cognitive task (block paradigm), characterize the area of the brain with impairment of vascular regulation. Then these results predict and correct neurocognitive disorders on the basis of well known neuropsychological data.

Conclusions: To summarize, the results of the pilot application of the proposed methodology are consistent with the results of neuropsychological and medical examinations. It should be noted that the early signs of vascular cognitive impairment primarily manifested in neurodynamic disorders, i.e. in the memory, attention and control functions disturbances - the so-called cognitive control. The proposed methodology could be a useful tool for comparative diagnosis (re-examination) to identify changes in brain cerebrovascular reactivity during the *assessment, diagnosis and treatment of vascular neurocognitive disorders*.

The study is partially funded by RHSF project #13-06-00570.

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“Making the Most of Your Memory”: a pilot study in a group of older adults with subjective and objective memory complaints

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Background and aims: The aim of the current study was to evaluate the effectiveness of tailoring a published cognitive rehabilitation program (“Making the Most of Your Memory”; Radford, Say, Thayer, & Miller, 2010) for older adults with mild cognitive impairment (MCI) and early dementia.

Method: Six older adults ranging in age from 67 to 95 ($M = 79.17$, $SD = 10.61$) with MCI or early dementia underwent a six-week memory training program consisting of psychoeducation about memory and ageing, discussion of lifestyle factors that can impact memory, and teaching and practice of internal and external memory strategies. The present study piloted the use of an individualised Goal Monitoring Record, as a means to improve the assessment of everyday memory function and the measurement of potential changes in response to intervention.

Results: Within-group improvements following training were evident on an objective memory measure, with significant improvement in delayed memory performance on the Hopkins Verbal Learning Test from baseline to post-intervention ($t(4) = 6.53$, $p = .002$ (one-tailed)). Data from the independent prospective memory tasks assigned throughout the training program show that the number of participants who completed each task increased from Week 2 to Week 6. On the Prospective and Retrospective Memory Questionnaire (PRMQ), there was a significant improvement from baseline to post-intervention on the Retrospective scale ($t(5) = 2.54$, $p = .026$ (one-tailed)).

Conclusions: Overall, this pilot investigation produced some encouraging results, warranting further exploration of this program with the inclusion of a control group.

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Exploration of the relationship between Working memory, academic achievement and behaviour

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Aims: To investigate a possible association between Working Memory (WM) and reading and maths achievement. It also investigated whether WM deficits were reflected in children’s behaviours as observed by teachers and parents. A related aim investigated the prevalence of learning disorders or experiences that have been linked to WM deficits.

Method: The Automated Working Memory Assessment (AWMA) was used with a group of 60 children aged 9 – 11 years in New Zealand.

Results: 20% of the group obtained low WM scores. Two groups of children were selected based on their reading and maths achievement (13 average and 16 below average). The below-average academic group performed significantly lower than the average academic group on all but one subtest of the AWMA. No significant differences between groups were noted by sex or ethnicity. The children with low WM scores were rated as having more frequent behaviours relating to WM problems than children with average and above WM. Children with low and average WM ability were both reported as having experiences or disorders related to WM deficits.

Conclusions The results corroborate previous findings and may be of interest to educators in that WM ability is a building block that may affect the acquisition of information during learning episodes at school. The child with low WM may not have inherent difficulty with the academic work, but in taking in the information. Assessment of WM may identify children who may need to learn in a different way in order to reach their academic potential.

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Short Term Cognitive Change during Electroconvulsive Therapy for Unipolar and Bipolar Depression: A Prospective Study

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Background and aims: Although Electroconvulsive therapy (ECT) is the most effective treatment for major depressive disorder its use is limited due to ongoing reports of cognitive impairment secondary to the treatment. Patients commonly report cognitive dysfunction post ECT which is often not detected in objective cognitive assessments. To effectively assess ECT related cognitive change, further research needs to be conducted into increasing the sensitivity of the cognitive assessment. The current aimed to determine: 1) what cognitive changes occurred during the course of ECT; 2) the nature of impairment and recovery of these changes over time; and 3) which assessment measures were sensitive to detecting change.

Method: 13 patients receiving ECT for treatment resistant major depressive disorder or bipolar disorder aged between 18 - 78 were recruited into the study. A comprehensive cognitive assessment was conducted prior to starting the course of ECT, again after every three treatments of ECT and at 6 week follow-up.

Results: The data were examined as a series of case studies and analysed collectively. The nature of cognitive impairment varied across individuals and was dependent upon mood and number of treatments. Cognitive impairment typically occurred during the course of treatment; however, by the follow-up assessment most domains of cognition had returned to at least the baseline level of function.

Conclusion: ECT caused cognitive dysfunction across a broad range of functions in the short term for the current sample; however, this dysfunction typically resolved by six weeks post ECT. The assessment measures sensitive to detecting the cognitive changes are reported.

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Introducing the CASDECT – a Cognitive Screening Measure for use during Electroconvulsive Therapy

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Background and aims: Cognitive impairment remains a common side effect of electroconvulsive therapy (ECT) and accordingly frequent and thorough cognitive assessment during the course of treatment is recommended to detect cognitive change. Although recommended, the way in which cognition should best be assessed remains undetermined and under debate. The Cognitive Assessment Screen for use

During ECT, (CASDECT) is introduced here as a potential method to assess cognition during a course of ECT.

Method: The contents were derived from the research with people who have undergone ECT, feedback from practitioners conducting cognitive assessments, feedback from consumers of the therapy and from the existing literature into the cognitive effects of ECT. The measure was then trialled with a non-depressed community dwelling sample who had not undergone ECT previously.

Results: Normative data has been obtained for the measure. The screening measure is brief (20 minutes), covers a broad range of cognitive domains and has three alternate forms to control for practice effects.

Conclusions: The measure has acceptable psychometric properties and is offered as an alternative for use with people undergoing ECT. It is currently in use in a number of New Zealand settings and will be further evaluated in due course.

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Predictors of Subjective Memory Decline in a Community Sample of Older Adults: A Structural Equation Model Analysis

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Background and aims: Subjective memory decline (SMD) has been suggested as a risk factor for dementia. However, the relationship between SMD and current cognitive function is at best small. Prospective memory is a complex cognitive process, requiring an interaction of retrospective and memory and executive attention. Recent studies have identified prospective memory impairment as characteristic of the prodromal phase of Alzheimer's disease (mild cognitive impairment). Therefore, prospective memory may provide a sensitive index of very early changes in memory, before observable impairment on more traditional neuropsychological tests. The primary objective of this study was to use structural equation modelling (SEM) to examine the relationship between SMD and neuropsychological performance, including prospective memory. Mood was also included in the model as some research reports find an association between SMS and mood.

Method: A community sample of 177 healthy older adults completed a questionnaire assessing SMD, mood symptoms, and cognitive performance (including prospective memory, retrospective episodic memory, attention and executive functions). SEM was used to test models of the relationships among subjective memory, mood, and cognitive function.

Results: Prospective memory accounted for a small but significant amount of the variance in SMD whereas other domains of cognition did not emerge as significant predictors. To a lesser extent, mood independently contributed a small amount of variance in SMD.

Conclusions: Older adults reporting SMD may experience greater difficulty in prospective remembering than those without SMD. This is important as impairments in prospective memory have also been reported in the prodromal phase of Alzheimer's disease, suggesting the need for further longitudinal research of older adults with SMD.

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A new cognitive and sensory stimulation intervention in psychogeriatrics

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Background and aims: Both cognitive and sensory stimulation therapies are based on the idea that stimulation of memory, language, attention and the senses may be useful in slowing rate of cognitive decline and reducing incidence of behavioural disturbance in individuals with dementia. We developed a group program for inpatients on a psychogeriatric unit to provide regular weekly activities providing cognitive and sensory stimulation. We had identified that many patients showed low levels of spontaneous functional communication. In addition, many patients were on modified diets and showed reduced interest in meals. To address this, activities were embedded within a weekly cooking and communication group.

Method: The group program was run for 8 weeks. Pre and post assessments of cognition, communication and behaviour were carried out. Sensory skills, communication output and mood were assessed each session.

Results: Participants showed an average increase in spontaneous functional communication of 125% over the 8 week period. Participants reported increased interest in meals and showed increased participation in food preparation. Behaviour ratings showed decreased apathy and improved mood. Attention to sensory stimuli improved. Carers reported reduced negative behaviours following each session.

Conclusions: Initial results showed that a combination of cognitive and sensory stimulation activities within a weekly cooking and communication group may benefit psychogeriatric patients in a range of ways. Research is ongoing to refine the interventions and evaluate against control groups.

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Developmental trajectories of Human Brain White Matter from Infancy to Early Adulthood: A Diffusion Tensor Imaging Study

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Background and aims: Diffusion tensor imaging (DTI), which measures the magnitude of anisotropy of water diffusion in white matter, has recently been used to visualize and quantify parameters of neural tracts connecting brain regions. The purpose was to quantify normal developmental characteristics of the brain white matter from infancy to early adulthood.

Method: Participants included 54 healthy subjects (21 females and 33 males; 2 months to 25 years). Each DTI was acquired with a single-shot echo planar imaging sequence on a 1.5-Tesla Magnetom Vision scanner. We extracted the tracts of interest (TOIs) using the region of interest method: the corpus callosum (CC), cingulum hippocampus (CGH), inferior longitudinal fasciculus (ILF), and superior longitudinal fasciculus (SLF). We measured fractional anisotropy (FA), apparent diffusion coefficient (ADC), axial diffusivity (AD), and radial diffusivity (RD). Approximate values and changes in growth rates of all DTI parameters at each age were calculated and analyzed using locally weighted scatterplot smoothing.

Results: We found that for all TOIs, FA increased with age, whereas ADC, AD, and RD values decreased with age. The turning point of growth rates was at approximately 6 years. FA in the CC was greater than that in the SLF, ILF, and CGH.

Moreover, FA, ADC, and AD of the splenium of the CC (sCC) were greater than in the genu of the CC (gCC), whereas the RD of the sCC was lower than the RD of the gCC. The FA of right hemisphere TOIs was significantly greater than that of left hemisphere TOIs. In infants, growth rates of both FA and RD were larger than those of AD.

Conclusions: Our data shows that developmental patterns differ by TOIs and myelination along with the development of white matter, which can be mainly expressed as an increase in FA together with a decrease in RD. These findings clarify the long-term normal developmental characteristics of white matter microstructure from infancy to early adulthood.

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Early Life Correlates of Need for Cognition in Healthy Older Adults

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Background and aims: Need for Cognition (NFC, Caccioppo and Petty, 1982) is a personality trait characterized by a person's tendency to engage in and enjoy thinking and cognitive elaboration. Correlating with, but not synonymous with intelligence, prior research has found high NFC individuals to be more susceptible to false memories due to greater activation of semantic associations of words (Petty, Brinol, Loersch, & McCaslin, 2009). Hypothesizing that greater cortical activation may develop higher levels of cognitive reserve, the goal of this study was to explore early life correlates of NFC to assess overlap with other factors known to be predictive of cognitive reserve in later life.

Method: Fifty (21 men, 30 women) cognitively healthy (MMSE $M = 28$, range 25–30) older (mean age 74 years, $SD = 12$) individuals completed the NFC Scale (Cacioppo and Petty, 1982), the NASA Physical Activity Scale, a depression scale (CES-D) and an extensive questionnaire regarding early life experiences. WASI Vocabulary and Matrix Reasoning scores, Digit Span, and the MARS Contrast Sensitivity Test performance (an indirect dopamine marker) were also obtained.

Results: NFC was found to correlate significantly with education, Vocabulary, Matrix Reasoning, MMSE, playing mental and physical games, traveling, visiting museums, attending live performances, reading the news and technical material, and various kinds of writing (blogs, letters, papers, etc.). High NFC was also moderately correlated with having learned other languages at home ($r = .416$), which has previously been found to correlate with cognitive reserve, but not with having learned languages after leaving home. Gender, age, parental education, and ethnicity were not related to NFC. Music and dance-related activities were, surprisingly, also not related to NFC.

Conclusions: NFC is an individual characteristic that is easy to measure, that is related to learning more than one language at home, is related to actively engaging in writing, and holds promise as an early predictor of cognitive reserve. As such it is deserving of further study.

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Neurocognitive and Symptom Trajectories of ADHD from Childhood to Early Adolescence

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Background: This longitudinal study investigated changes in neurocognitive functioning from childhood to early

adolescence in a sample of children diagnosed with Attention Deficit Hyperactivity Disorder (ADHD). It also examined whether neurocognitive trajectories differed between those children who continued to meet criteria for ADHD and those in partial remission in early adolescence.

Methods: Children diagnosed with ADHD ($N = 55$) were tested at baseline [$M = 7.7$ years, $SD = 0.2$] and follow-up [$M = 11.7$ years, $SD = 1.5$] on measures of intellectual, academic, and executive functioning. Diagnostic status was reevaluated at follow-up to examine patterns of performance in those children who continued to meet full criteria and those who did not. Group and individual analyses were used to examine trajectories of neurocognitive functioning and symptom change from baseline to follow-up.

Results: At a group level, the study generally demonstrated stable performances on measures of intellectual and academic functioning from baseline to follow-up, and stable or improved performances on measures of executive functioning over time. Subgroup analyses revealed that patterns of neurocognitive performance did not generally differ between children who continued to meet criteria for ADHD and those who did not. Neurocognitive trajectories were also examined at an individual level. These analyses revealed that while the majority of children demonstrated stability in their performances over time, greater than expected proportions of improvement were found on measures of intellectual functioning, and greater than expected proportions of deterioration were observed on measures of academic achievement. Finally, when examining the trajectories of those children who continued to meet criteria and those who did not, the subgroups deviated from one another on a number of intellectual and academic measures.

Conclusions: This study indicates that many children diagnosed with ADHD may continue to display neurocognitive difficulties as they transition from childhood to early adolescence. Further, even if children demonstrate some remittance of their ADHD symptoms over time, they may continue to experience many of the same difficulties as those children who continued to meet criteria for ADHD. Importantly, the findings highlight the need to examine change over time at an individual level in addition to group level analyses.

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Atypical progressive aphasia with anterior temporal lobe atrophy

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Background and aims: The semantic variant of primary progressive aphasia (svPPA), characterized by anterior temporal lobe atrophy, may be the most homogenous type of PPA. However, some patients with prominent atrophy of the anterior temporal lobe do not present the typical clinical picture of svPPA. This study aimed to distinguish clinical features in an atypical PPA patient with anterior temporal lobe atrophy from those in typical patients with svPPA.

Method: A 77-year-old man (patient NSV) visited our hospital because of progressive naming difficulties over two years. Although his speech was fluent, naming difficulties were prominent. The patient revealed repetition difficulties with phonemic paraphasia, unlike typical patients with svPPA, yet MRI demonstrated severe atrophy of the left anterior temporal lobe. We assessed his verbal function using neuropsychological batteries and compared it with that of three patients diagnosed with typical svPPA (patients SV1, SV2, SV3; mean age at examination, 61.3 years; two males and one female).

Results: NSV revealed some clinical features atypical of svPPA: i) poor repetition with phonemic paraphasia, ii) lack of the tendency to name objects with words in the superordinate category (e.g., “animal” for “dog”), iii) syntactic comprehension disabilities, iv) lack of surface dyslexia or dysgraphia, v) no dissociation between Japanese Kanji and Kana writing, vi) poor color naming, and vii) poor performance on the Raven’s Colored Progressive Matrices. However, NSV also showed some typical features of svPPA: i) poor comprehension of task instruction for repetition, ii) no phonemic cue effect in naming, and iii) poor sentence completion.

Conclusions: NSV did not fulfill the criteria for svPPA established by Gorno-Tempini et al. (2011). Instead, his results indicated deterioration of not only semantic but also phonological and syntactic aspects of verbal function. This mixed-type PPA should be considered in diagnosing patients with anterior temporal lobe atrophy.

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Grammatical Difficulties for Adults with Developmental Disorders

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Objective: This study examined the recognition and understanding of Japanese grammatical structures in adults with developmental disorders (DDs) to reveal potential comprehension difficulties.

Method: The participants were four adults with ASD, ADHD and LD aged between 19 and 36, and a control group of eight university students. They were individually given a Japanese grammatical test (J.COSS: Japanese test for comprehension of syntax and semantics) and a Wechsler Adults Intelligence Test. The J.COSS is a multiple-choice test consisting of 20 constructs with four items each. Each item has a choice of four pictures. The participants were required to select one picture that corresponded to a grammatical construction in written (Logographic) Japanese.

Results: Whenever a participant correctly answered the four questions in each grammatical construct, it was assumed that they could understand that block. Their J.COSS Scores / verbal IQs were 12 / 82, 14 / 89, 18 / 113, and 19 / 121 for the participants with DDs. The first two participants were evaluated at a six-seven year old level (LD and ADHD), yet the second two participants were at a normal level. The correlation between them was .99 indicating a very strong positive relationship. No matter how high IQ scores were, none passed the most difficult construct (center-embedded sentences), whereas all of control group were able to do so. Although previous study showed children with ASDs had difficulty comprehending passive sentences, there were no difficulties observed in this area.

Conclusion: This study examined Japanese grammatical difficulties in adults with DDs. There was strong correlation between J.COSS scores and verbal IQs for all participants. The participants with LD and ADHD, however showed an overall delay in grammatical competence. The participants with ASDs showed limited indication of grammatical difficulties when compared with control group. This suggests a correlation between DDs and Japanese grammatical comprehension.

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Factors That Influence Decision Making: An Explanatory Framework

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Background and aims: Case managers frequently make complex decisions about service provision and referrals as they seek to promote the participation and reintegration into the community of people with acquired brain injury (ABI). While making these decisions, there are many factors that case managers need to take into consideration. At the present time, research does not give specific attention to the factors that influence decision making when working with clients with ABI. This paper reports on a recent research study that aimed to 1) Identify and explore what factors influenced decision making regarding service provisions and referrals when working with clients with ABI, and 2) understand how these factors affected the applied process of decision making.

Method: The study was conducted in two phases. In phase one of the study, focus groups were conducted with nine cases managers. Case managers were a convenience sample recruited from a specialist ABI service in New South Wales and Victoria, Australia. In phase two, individual interviews were conducted with theoretical sampling (based on phase one results) of client cases from the experience of phase one participants.

Results: The study found factors influencing decision making were predominantly related to the client (including goals), the service system (including policies), and the case manager (including skills and resources). These results are formulated into an explanatory framework that portrays how the factors case managers take into consideration are interdependent and together influence the applied process of decision making.

Conclusions: The framework enhances our level of awareness about factors to consider during the decision making process and highlights how case managers function in a crucial mediating role between the client and the service system. This has specific implications for government policy, and case management practice when working with clients with ABI.

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Touch Screen DriveSafe DriveAware - A Valid Screening Tool for General Practitioners and Other Health Professionals to Use in Determining Fitness to Drive for Older and Cognitively Impaired Patients?

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Background and aims: Responsibility for determining fitness to drive typically falls to the primary healthcare physician. General practitioners report a lack of objective, valid, and reliable tools for predicting driving ability and report concern about the impact of withdrawing driving on the patient’s quality of life and the patient-doctor relationship. Improved survival rates after stroke or brain injury and an aging population mean greater numbers of people with cognitive impairment wishing to resume or retain driving. Appropriately identifying “at risk” drivers is a growing challenge for society, general practitioners and licensing authorities.

A standardised off- and on-road driving assessment conducted by a driver-trained occupational therapist is often considered the gold standard for determining fitness to drive. This method of testing, however, is time consuming and costly. Due to a shortage of specialist assessors, access in remote areas can be limited and even urban areas can have long waiting lists.

DriveSafe DriveAware (DSDA) has been used for many years by driver-trained occupational therapists as part of a clinical

assessment of fitness to drive. DSDA has sufficient sensitivity and specificity to accurately predict on-road performance but requires a trained administrator. A touch-screen version of DSDA was developed as a user-friendly screening tool that could be administered in the context of a medical appointment by general practitioners and other health professionals, without specialised training. A prospective study was conducted to examine; 1. The psychometric properties of touch screen DSDA and 2. The test's predictive validity.

Method: Touch screen DSDA was administered to 134 older and cognitively impaired drivers referred to 10 driving clinics across Australia and New Zealand. Results were compared to outcome of a standardised on-road assessment.

Results: Rasch analysis provided evidence for construct validity and internal reliability. Optimal upper and lower cutoff scores were determined to separate drivers into the categories 'safe', 'unsafe' and 'required further testing'. Sensitivity and specificity were calculated at 83% and 90% respectively.

Conclusions: Touch screen DSDA is a valid screening tool for determining who is a good candidate for an on-road assessment (i.e., will likely "pass") and who is not. People who are not a good candidate for an on-road assessment (i.e., will likely "fail") can be redirected to use their time and monetary resources in other ways.

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Does the performance of preterm preschool children on executive function tests predict executive functioning in real life?

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Background and aims: It is known that school-age children born preterm are at risk of developing executive function difficulties. However, preschool assessment of higher-order cognitive skills is an uncommon practice and relatively little is known about how to identify children most at risk prior to entering school. The aim of this study was to investigate the usefulness of current psychological assessment tools in predicting executive functioning in everyday life in preterm preschoolers.

Method: The participants were 127 children (61 boys and 66 girls) born preterm (under 33 weeks' gestation) in Tasmania in 2007-2008. At preschool (age 4 years), children were assessed by using the Wechsler Preschool and Primary Scale of Intelligence-3rd edition (WPPSI-III) and performance-based executive function tests, including parts of the Developmental Neuropsychological Assessment-II (NEPSY-II), Day-Night Stroop and Shape School. In the following year, at school (kindergarten), parents and teachers reported on the children's executive abilities in everyday activities using the Behavior Rating Inventory of Executive Function-Preschool Version (BRIEF-P).

Results: Low verbal IQ at preschool predicted a range of teacher-reported executive function difficulties, and low non-verbal IQ at preschool predicted some parent-reported executive function difficulties at school age. Children's preschool performance-based executive function predicted some of their later executive function ratings by parents and teachers.

Conclusions: Intelligence tests and performance-based executive function tests can be used with preterm children at 4 years to predict some, but not all, real-life executive functioning difficulties when entering school.

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Academic backwardness, a predictor of specific learning disorder

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Background and aim: Children who were referred with lack of concentration and academic backwardness form the sample of the study. The aim is to see the underlying cause for academic backwardness by evaluating their cognitive and language functions.

Method: A sample consisting of 100 children (70 boys and 30 girls, n = 100) between the age group of 6-14 years were randomly selected. The cases were referred to the authors by their school authorities / consultants because of the academic backwardness. Children were evaluated for an IQ assessment and for Specific Learning Disorder (SLD) by using a Standardized Intelligence Test and Help Child Learning Disability Assessment test. Verbal and performance intelligence and Specific learning disorders namely writing, spelling and reading were evaluated.

Results: The results showed the highest prevalence of Specific Learning Disorder (72%) in the age group of 7-12 years, 22% in the age group of 6-7 years and 6% in the age group of 12-14 years.

79% of the children have Specific learning disorders in writing, spelling and reading.

76% in the age group of 7-12 years, 20% in the age group 6-7 years and 4% in the age group 12-14 years have Specific Learning Disorder in writing, spelling and reading. Statistical significance is discussed in the main paper.

Conclusions: Overall results were suggestive of Specific Learning Disorder as the underlying factor in academic backwardness in the school going children. Hence, Specific Learning Disorder has to be screened wherever children were referred for academic / scholastic backwardness.

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Spouses' Experience of Living with Dementia: A synthesis of the qualitative research

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Background and aim: The majority of people with dementia live at home with the support of their spouse. While this situation has advantages, it brings many challenges for the spousal caregiver. Over recent years, a growing body of qualitative research has focused on understanding the spousal caregiver perspective. The aim of this study was to complete a metasynthesis based on qualitative studies exploring the spousal experience.

Method: A systematic search of the literature identified 16 published studies that met defined selection criteria. A thematic synthesis of the participant interview data derived from these studies was conducted.

Results: Results revealed five major themes. The theme of 'loss of partner' was central, and around this central experience spouses described various processes: acknowledging change, being in crisis, adapting and adjusting,

accepting and moving forward. The clinical implications of these findings will be discussed and explored.

Conclusions: These findings provide further insights into the day-to-day adjustments and experiences of spousal caregivers whilst highlighting the importance of considering dementia in a social-relational context.

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Executive Function in Adults with Williams Syndrome Reeve, Jessica L.¹; Porter, Melanie A.^{1,2}; Hocking, Darren R.³

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Background and aims: The primary aim of the study was to examine the functional impact of executive dysfunction in adults with Williams syndrome (WS). In order to achieve this aim, three research questions were explored, with each research question being a phase of the study: (1) Do parent/informant ratings differ depending on whether the Child Behavior Rating Inventory of Executive Function (BRIEF-C; Gioia, Isquith, Guy, & Kenworthy, 2000a) or the Behavior Rating Inventory of Executive Function—Adult version (BRIEF-A; Roth, Isquith, & Gioia, 2005) is administered?; (2) Does the BRIEF-C or the BRIEF-A correlate better with standardised performance-based measures of executive function (EF)?; and (3) Do adults with WS display universally elevated levels of executive dysfunction on the BRIEF?

Method: Parent report BRIEF-C and BRIEF-A ratings were collected on 20 adults with WS (aged 18.5 to 53 years), with a mean IQ of 60.95 ($SD = 17.67$). Performance-based measures of executive function (EF) included: The Shape School Test (Espy, 2007); select subdomains of EF from the Woodcock-Johnson III Tests of Cognitive Abilities, Australian Adaptation (WJ III COG; Woodcock, McGrew, & Mather, 2001); and select subdomains from the Vineland Adaptive Behaviour Scales, Second Edition—Parent Survey (Vineland-II; Sparrow, Cicchetti, & Balla, 2005).

Results: In relation to the initial two research questions, it was found that: (1) parent ratings on the BRIEF-C and BRIEF-A varied considerably and (2) The BRIEF-A was highly correlated with performance-based EF measures, whereas the BRIEF-C was not. Overall, the results provided support for the use of the BRIEF-A as the more valid measure for evaluating EF in adult patients with WS. As such, the third phase provided a typical executive function profile for the WS population when using the BRIEF-A and showed areas of intact and impaired ability.

Conclusions: This study addresses a number of important clinical issues relating to the assessment of EF in adults with WS. An increased understanding of the level of deficits in adult WS individuals will help guide the selection of suitable assessment and diagnostic procedures, targeted interventions and effective management strategies. This, in turn, will assist these individuals to live more independently in the community and allow adults with WS to achieve an enhanced quality of life.

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MAXCOG: a randomised control trial of individualised cognitive rehabilitation for clients with mild cognitive impairment and early dementia
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Background and aims: Individuals with Mild Cognitive Impairment (MCI) and early dementia face difficult challenges and increased reliance on family members due to subtle changes in their capacity to undertake more difficult day to day tasks (e.g., managing their finances or dealing with conflict). These subtle changes place them at increased risk of poor mental health and interpersonal difficulties. Successful adjustment and adoption of strategies to manage cognitive issues may help to maintain independence and quality of life for this group. We developed the MAXCOG intervention, which involves four face-to-face sessions with the person with MCI and a close supporter, with a focus on learning new goal-directed strategies to help manage cognitive impairment.

Method: A randomised control trial of the MAXCOG intervention versus treatment as usual with 55 clients who had been diagnosed with MCI or Early Dementia. A neuropsychologist and two Alzheimer's Australia Victoria psychologists from the early intervention team delivered the intervention. Quantitative measures were taken pre and post the intervention and supplemented with qualitative methods.

Results: Narrative accounts from clients and their supporters generally described positive changes in day-to-day life post MAXCOG. Preliminary quantitative analysis indicates that the majority of clients who received MAXCOG achieved their goals partially or fully and reported high satisfaction on the Canadian Occupational Performance measure - our primary outcome measure. Improvement on indicators of mental health included significantly lowered 'helplessness' ratings on the Illness Cognition Questionnaire post intervention.

Conclusions: A face-to-face individualised cognitive rehabilitation approach shows promise as an acceptable treatment that provides direct assistance with day to day tasks valued by clients.

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Stability of diagnosis in behavioural-variant frontotemporal dementia

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Background and aims: Behavioural-variant frontotemporal dementia (bvFTD) is an early onset dementia characterized by debilitating changes in personality and behaviour. These changes include inappropriate social behaviour, apathy, disinhibition, and loss of empathy and insight. Diagnosing bvFTD is complex and can change with disease progression. Delayed diagnosis or misdiagnosis of psychiatric disorders is common, causing significant burden for patients and families, and impeding appropriate treatment and management. This has been identified as a key dementia research priority in the 2015 NHMRC Priority Setting Project. Current consensus criteria published in 2011 outline features for a diagnosis of possible, probable and definite bvFTD. We aimed to assess the stability of bvFTD diagnosis made prior to 2011, with emphasis on factors that increase diagnostic certainty subsequent to the initial clinical opinion.

Method: We undertook a multi-disciplinary panel, retrospective case review of all patients who presented to a tertiary behavioural neurology clinic with a referral or initial diagnosis of bvFTD between January 2008 and December 2011 (total n = 28). Patients who were followed up at least

twice and over at least 12 months were included in the final sample. Diagnosis after investigation and follow-up was agreed via panel consensus, allocated to possible, probable or definite bvFTD, or other diagnosis (psychiatric, other neurological disease, etc).

Results: We found that diagnosis was more likely to change from possible bvFTD to other when patients had: a positive psychiatric history; normal neuroimaging with PET or MRI; no family history of neurodegenerative disease; or the presence of motor symptoms. The presence of both behavioural and language features on presentation was common and represented a problem with FTD categorisation rather than diagnostic difficulty.

Conclusions: Understanding the factors that increase diagnostic certainty allows for better prognostication, thus alleviating some of the burden associated with uncertainty and delays in the diagnostic process.

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Long-term outcome following mild or moderate pediatric head injury

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Background and aims: This research investigated long-term outcome following a Traumatic Brain Injury (TBI) sustained in infancy. The research aimed to clarify the predictive utility of injury severity towards long-term outcome by better characterizing outcome following moderate TBI, and determining the appropriateness of a stratified definition of mild TBI.

Method: 107 children (n male = 60) aged between 6-15 years (M = 9.9 years) participated in the study. The sample consisted of three injury severity groups; uncomplicated mild (n = 18), complicated mild (n = 34) and moderate (n = 22) TBI, and 33 healthy control children. TBI groups sustained their injury at a mean of 1.9 (range = 0.1 – 3.9) years, and were assessed at a mean of 8.14 (range = 5.0 – 12.0) years post injury. All children underwent neuropsychological assessment and parents completed ratings of behavioural, emotional and social competency/functioning.

Results: Findings showed children were vulnerable to a range of neuropsychological and psychosocial deficits following a moderate TBI sustained at a young age several years post injury. Findings also supported a stratified definition of mild TBI by showing outcome following uncomplicated and complicated mild TBI could be differentiated on measures of complex attentional function, and internalizing and externalizing behavior regulation skills.

Conclusion: Findings highlighted the need for increased emphasis on clinical management of mild and moderate TBI sustained in early childhood.

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Three decades on: language competence and self-reported satisfaction with social relationships in adults with a history of childhood traumatic brain injury

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Background and Objectives: Traumatic brain injury (TBI) during childhood can impact upon language competence and social relationships throughout an individual's lifespan. Negative trajectories have been documented for both domains, respectively. However, little is known about their interplay, particularly in the long run post-injury. The current study aims to investigate whether language competence contributes to social outcomes in long-term survivors.

Method: Participants were 12 females and 8 males aged 30-55 years (M = 39.80, SD = 7.54) who were 31 years post-childhood TBI (SD = 9.69), and a matched control group. Assessment involved the *Test of Language Competence – Expanded Edition, Level 2 (TLC-E)* and the *Social Relationships* scale of the *Quality of Life in Brain Injury (QOLIBRI)* questionnaire. *TLC-E* and *QOLIBRI* scores were compared between groups. Within the TBI sample, regression analyses were performed entering *TLC-E* raw scores as predictor variables and *Social Relationships* scores as the dependent variable.

Results: Scores on the *Social Relationships* scale and the *TLC-E* subtests of *Ambiguous Sentences* and *Recreating Sentences* were significantly lower in the TBI group. Performance on the *TLC-E* subtest of *Ambiguous Sentences* was found to be a significant predictor of self-reported satisfaction with social relationships, explaining 24.6% of the variance observed.

Conclusions: Impairments in both domains can persist decades post-injury and competence in resolving ambiguous sentences contributes to satisfaction with social relationships. By focusing on adults three decades post-injury, the current findings provide an important extension of our knowledge pertaining to the link between language competence and social outcomes following childhood TBI.

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That looks like the Queen, but it's really Aunty Mary: Face-name training in semantic dementia

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Background and aims: Semantic dementia (SD) is characterised by marked naming and comprehension impairments. For patients with significant atrophy in the right hemisphere, prosopagnosia may also result. While studies have shown that SD patients can relearn object labels with training, there has been very little investigation regarding the effectiveness of retraining people's names.

Method: Two patients were recruited: (i) a 63-year-old female with right lateralised SD, and (ii) a 64-year old male with left lateralised SD. Three sets of face stimuli were created, comprising photographs of family and friends (n = 5-7/set) and previously known famous people (n = 5-6/set). Set 1 was trained 5 days a week for 1-month using a repetitive pairing of the face and name, followed by training of Set 2. The third set remained untrained. Assessments were conducted at baseline, during therapy and immediately post-intervention. Patients were required to (a) correctly name photographs of the trained faces, as well as an alternative, untrained version of each face, and (b) reject age- and sex-matched unfamiliar foils.

Results: Significant improvements in the ability to name trained faces were observed from baseline to immediate post-intervention (McNemar's Test, $p < .001$). Improvements were, however, not statistically significant when tested on the alternative images of the trained faces. Over the same period, the ability to name untrained faces did not change.

Conclusion: SD patients can learn to associate a name with a face, although the ability to generalise this beyond the training stimulus appears limited.

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Characterisation of Aggression in Huntington's disease: types, antecedents and treatment implications

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Background and aims: Rates of aggression in Huntington's disease (HD) are high. However, very little is known about the types of aggression displayed and the antecedents/triggers for this behaviour. To treat aggression in HD the focus has generally been placed on psychotropic medication with very few non-pharmacological interventions reported. The aim of this study was to identify the nature of the aggression displayed by HD sufferers and antecedents that may contribute to this behaviour.

Method: A systematic data audit was conducted of hospital electronic records for 10 HD clients admitted to a specialist brain disorders unit for treatment over a four-year period. Individual records were audited for the first 90 days of admission. All aggressive behaviours, antecedents and consequences were recorded using the Overt Aggression Scale-Modified for Neurorehabilitation.

Results: The results indicated that 9/10 clients exhibited aggression during the audit period. 237 episodes of aggression were captured altogether. Verbal aggression was most common (36.7%), closely followed by physical aggression to people (33.8%), mixed episodes of aggression (24.1%), and episodes of physical aggression to objects/furniture (5.5%). The most common antecedent for aggression was physical guidance/facilitation to complete a task, followed by meal times/the provision of food and being asked a specific request; while no clear antecedents were recorded in the medical record for 16% of the aggressive episodes. Individual susceptibility to specific antecedents was identified for a number of clients.

Conclusions: The study indicated that clear environmental, behavioural and sensory antecedents exist that can lead to aggression in HD sufferers. This has important implications for the treatment of aggressive behaviour in HD utilising non-pharmacological methods such as positive behaviour support frameworks and sensory modulation interventions.

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Clinical features associated non-tremor dominant Parkinson's disease

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Background and aims: While the existence of mild cognitive impairment (MCI) in Parkinson's disease (PD) is widely recognized, the clinical features associated with it have yet to be well characterized. The concept of distinct clinical phenotypes in PD is well documented. Certain characteristics, such as predominant motor subtypes, have been most widely used to identify distinct PD cohorts, as well as their association with cognitive impairment. In general, these studies indicate that PD patients whose motor dysfunction is principally characterized by non-tremor features have more

severe cognitive impairments than those with tremor dominant symptoms. However, to date, only very few studies have concurrently examined the interrelationships between cognition, sleep, and neuropsychiatric symptoms in the non-tremor dominant PD subtype. The aim of this study was to explore the expression of a range of clinical symptoms in PD patients with non-tremor dominant features.

Method: Forty-eight PD patients with non-tremor dominant features were included in the study. All participants were in the early stages of PD (between Hoehn and Yahr stages I and III).

Results: The non-tremor dominant cohort was associated with a high prevalence of PD-MCI (54%). A high prevalence of freezing of gait (69%), daytime somnolence (40%), hallucinations (23%) and rapid eye movement sleep behaviour disorder (56%) was also observed in this cohort.

Conclusions: Results from the present study suggest that the PD patients with non-tremor dominant features were associated with a high prevalence of other clinical symptoms. A greater understanding of how PD-MCI relates to other motor and non-motor features may help lead to an early identification of cognitive decline as there may be certain disease characteristics that could herald the emergence of cognitive decline.

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Aspects of natural conversation in Primary Progressive Aphasia

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Background and Aims: Primary Progressive Aphasia (PPA) is a clinical syndrome resulting from neurodegenerative disease, the most prominent feature being the gradual dissolution of language with initial sparing of other cognitive domains. Three variants are currently recognised; nonfluent/agrammatic (nfvPPA), logopenic (lvPPA) and semantic (svPPA). Difficulty in conversing is a primary complaint of people with PPA and their carers. While much is known about cognitive and linguistic impairments in PPA and their neural and pathological bases, little attention has been focused on conversation breakdown. We present two studies that investigate aspects of natural conversation in PPA. The aims were to describe the contribution to conversation of people with PPA, and the trouble and repair, and success of repair in their conversations.

Method: Ten dyads, each with one partner with PPA, and ten control dyads were recorded in a ten-minute conversation. The conversations were examined for productivity measures and trouble and repair behaviours.

Results: Although the quality of conversational turns was reduced for all participants with PPA, they maintained their share of turn taking. People with nfvPPA and lvPPA demonstrated a variety of trouble indicating behaviours rather than the non-interactive types that have been observed in studies of conversation in Alzheimer's Disease (AD). The partners bore the burden of highlighting trouble and need for repair. People with svPPA produced a wide variety of trouble and repair behaviours and these were unlike the patterns observed in nfvPPA, lvPPA and AD. There was a trend for greater non-interactive trouble-indicating behaviours as seen

in AD in the more cognitively impaired participants. Finally severity of naming impairment and the contribution of the communication partner appeared to be important factors in success in conversation.

Conclusions: Different patterns of conversational trouble and repair in PPA dyads reflect the different patterns of language and cognitive impairment in each variant and the dynamic interaction between partners in a dyad. These findings can inform clinical practice. Generic advice about strategies to facilitate success in conversation will not meet the needs of individuals with PPA and tailored approaches are required. Understanding conversation breakdown in PPA may improve the effectiveness of behavioural interventions and so promote quality of life for individuals with PPA and carers.

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Attention deficit hyperactivity disorder, a co-morbid factor in specific learning disorder (sld)

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Background and aims: Attention Deficit Hyperactivity Disorder is a co-morbid factor in children with Specific Learning Disorder. Children with lack of concentration, not sitting in class, difficulty in writing were referred for neuropsychological assessment.

Method: 100 school going children (70 boys and 30 girls) between the age group of 6 -14 years form the sample of the study. These children were referred by the school authorities / family physicians. They were assessed on the Standardized Test for intelligence and Specific Learning Disorder. These children were evaluated by DSM V for the diagnosis of Attention Deficit Hyperactivity Disorder and its types.

Results: Of the 100 children, who has Specific Learning Disorder, 56% of children have Attention Deficit Hyperactivity Disorder, hyperactive/ impulsive type, 31% have inattentive type and 13% have combined type. In the age group 7-12 years, 74% of children have Attention Deficit Hyperactivity Disorder, inattentive type with the co-morbid Learning Disorder, 19.3% of the age group 6 -7 years and 6.5% in the age group 12-14 years.

In the age group 7-12 years, 69.6% of children have Attention Deficit Hyperactivity Disorder, hyperactive/impulsive type with the co-morbid Learning Disorder, 25% of the age group 6 -7 years and 5.5% in the age group 12-14 years.

In the age group 7-12 years, 77% of children have Attention Deficit Hyperactivity Disorder, Combined presentation with the co-morbid Learning Disorder, 15.3% of the age group 6-7 years and 7.6% in the age group 12-14 years.

In the age group 7-12 years, Attention Deficit Hyperactivity Disorder - combined type 77% of children have co-morbid Learning Disorder, 70% of children in Attention Deficit Hyperactivity Disorder, hyperactive / impulsive type have co-morbid Learning Disorder and 74% of children in Attention Deficit Hyperactivity Disorder, inattentive type have co-morbid LD.

Conclusions: In Attention Deficit Hyperactivity Disorder children, Specific Learning Disorder is a co-morbid factor. So, it is mandatory to rule out Specific Learning Disorder in Attention Deficit Hyperactivity Disorder and vice versa.

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Cognitive training in Parkinson's disease: A meta-analysis of randomized controlled trials

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Background and aims: In addition to motor disturbance, patients with Parkinson's disease commonly display cognitive changes ranging from subtle and specific deficits through to dementia. Cognitive Training (CT) is an emerging novel technique for improving cognition. We aimed to quantify the effects of CT on cognitive and behavioral outcome measures in patients with PD.

Method: We systematically searched multiple online databases for randomized controlled trials (RCTs) of CT in PD patients reporting cognitive and/or behavioral outcomes. Efficacy was measured as standardized mean difference (Hedges' g) of post-training change.

Results: Seven studies encompassing 272 patients were included. The overall effect of CT over and above control was small and statistically significant. Heterogeneity across studies was low and there was no evidence of publication bias. Larger effect sizes were noted on working memory, processing speed and executive functions. Effects on global cognition, memory, visuospatial skills and depression were not statistically significant. Attention, quality of life and activities of daily living could not be assessed due to low study numbers.

Conclusions: The current body of RCT evidence indicates that CT is modestly effective on cognition in PD. These findings highlight the importance of CT as an emerging therapeutic approach in PD, though the field would benefit from further RCTs using standardized endpoints to examine the effects on key clinical indices in this population.

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Can we participate? Barriers and facilitators to community participation in children with an acquired brain injury

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Background and aims: The nature and extent of participation in community activities in children with disabilities is influenced by a number of health-related, functional, and contextual factors. Yet, the pertinence of these factors to children with an acquired brain injury (ABI) is unknown. The aim of this study was to identify the most significant barriers and facilitators impacting upon participation in community activities in children with ABI.

Method: A cross-sectional study using Q-sort methodology was employed; a robust mixed methods approach presenting a quantitative measure of subjective data. Prior to its use, the q-sort task was piloted by a steering group to ensure its relevance and suitability to families in a busy clinical setting. Parents of children with a moderate/severe ABI were asked to sort a set of 37 predetermined statements onto a normal distribution grid, according to their level of agreement to each

statement. Factor analysis identified prominent viewpoints and the most significant barriers and facilitators to community participation.

Results: The sorts of 39 parents were included, and three distinct viewpoints were identified. The three viewpoints revealed some consensus regarding the facilitators to community participation, inclusive of both child and parent factors. Contended statements were related to the impact of impairment and the environment as barriers and/or facilitators, and differed significantly between viewpoints. The perceived ability to participate decreased between viewpoints with a stepwise trend, from 'we can', 'we want to' and 'we try'.

Conclusions: Factors affecting community participation are not uniform amongst families. Intervention at the level of the environment should be explored to maximise the participation of children with an ABI.

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Social cognition and the self-reference effect in Alzheimer's disease and behavioural variant frontotemporal dementia

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Background and aims: Evidence shows that processing information in reference to the self enhances subsequent memory for the source of this information. While both Alzheimer's disease (AD) and behavioural-variant frontotemporal dementia (bvFTD) patients show source memory impairment, it remains unclear whether these patients show the typical memory advantage for self-referenced materials. We also aimed to explore the relationship between self-referential processing and social cognition in these patient groups.

Method: The 'self reference effect' (SRE) paradigm was tested in AD (n=16) and bvFTD (n=22) patients and age-matched healthy controls (n=16). In this task, participants studied pictures of common objects paired with one of two background scenes (sources) under self-reference, other-reference or self-external encoding instructions, followed by an item and source recognition memory test. Perspective taking and empathy were assessed using carer ratings on the Interpersonal Reactivity Index (IRI). Voxel-based morphometry was used to investigate correlations between SRE and IRI measures and regions of grey matter atrophy.

Results: Our findings confirmed the source memory impairment in both AD and bvFTD compared to controls. We also found that the SRE was similarly reduced in both patient groups. IRI ratings were significantly lower in both AD and bvFTD, with the latter group most impaired. Higher ratings of perspective taking and empathy were associated with a larger SRE. Notably, the medial prefrontal cortex (mPFC) was

identified as a shared neural substrate of SRE and IRI measures.

Conclusions: Self-referential encoding does not appear to ameliorate the significant source memory impairments in AD and bvFTD patients. This study confirms the importance of the mPFC in mediating self-referential aspects of memory and social cognition.

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The fluency flip: Identification of prodromal Alzheimer's disease in Mild Cognitive Impairment

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Background and aims: Along with memory decline, one early sign of cognitive deterioration in Alzheimer's disease (AD) is reduced facility with language. This impairment is thought to reflect the impact of neurodegeneration on semantic processing, as reduced output on semantic (category) fluency tasks is typically observed relative to performance on orthographic (letter) fluency. As the pathological changes characterising AD occur many years prior to disease expression, changes on tasks of semantic fluency may be evident in individuals with Mild Cognitive Impairment (MCI), a group with a high AD transition rate. The present study aimed to understand the nature of early deterioration in verbal fluency performances and its prognostic value: patterns of fluency were measured in both MCI and Healthy Control (HC) groups who either showed evidence of significant amyloid burden, or did not; independently of biomarker status, patterns were also assessed in terms of later transition to a diagnosis of AD.

Method: As part of the Australian Imaging Biomarkers and Lifestyle (AIBL) Study of Ageing, 1112 participants were recruited as part of a longitudinal study, and underwent neuropsychological assessment every 18 months. Baseline performances on verbal fluency were measured by tasks of letter fluency, category fluency and category switching from the Delis-Kaplan Executive Function System (D-KEFS). Participants were characterised as either HC, MCI or AD. A subsample of participants also underwent PiB PET imaging for in vivo analysis of amyloid burden.

Results: The biomarker positive HC group with high amyloid burden displayed a greater disparity between letter and category switching, relative to HCs with low amyloid burden; surprisingly no differences were observed in MCI participants. A longitudinal analysis also demonstrated that category switching but not category fluency explained additional variance above and beyond amyloid burden, between MCI individuals who transitioned to AD within 54 months, and those who did not.

Conclusions: Overall the results from this study revealed that category switching and a letter-category discrepancy may be more sensitive to detecting MCI and AD than category fluency alone. This reinforces the notion that early semantic decline could be a useful prognostic cognitive sign, and suggests that more complex tasks combining fluency and an

explicit executive (switching) element might be particularly useful.

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Resting-state Functional Magnetic Resonance Imaging of Patients with Leukoaraiosis and Mild Cognitive Impairment: A cross-sectional study

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Background and aims: Recent studies demonstrate that an fMRI signal change in certain brain areas during the resting state is a significant functional marker in patients with mild cognitive impairment (MCI). However, resting-state fMRI (rs-fMRI) research on LA in MCI patients is scarce. The aim of this study was to investigate differences in the rs-fMRI default network between patients with LA-associated MCI and normal subjects, and provide functional imaging evidence of LA-associated MCI during early stages of the disease.

Method: All subjects were outpatients or residents of the Beijing Tiantan Hospital, and were divided into two groups: a mild cognitive impairment (MCI) group and a control group. Demographic information was obtained; the patients were assessed using the Hamilton Depression Scale, Clinical Dementia Rating, Mini Mental State Exam and Montreal Cognitive Assessment. Experiment data and confounding factors were described by General Linear Model. Independent component (ICA) of fMRI Data from LA and control groups was analyzed by fMRI tool box.

Results: The activity in each brain area of the patients with LA MCI was decreased. The differences regarding which areas exhibited decreased activity in LA MCI patients was associated not only with damage in the Papez circuit, which is involved in memory, motion and behavior, but also with in the medial prefrontal hippocampus and inferior temporal gyrus, which have been associated with cognition.

Conclusion: Our findings provide a hypothesis regarding the pathophysiological mechanisms of LA, and could be used to provide useful neuroimaging evidence for the early recognition of LA MCI.

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FRIDAY, JULY 3, 2015

7.00 – 9.00	REGISTRATION at Registration Desk in Grand Ballroom Foyer Tea/coffee/break item on arrival in Grand Ballroom Foyer and Brisbane Room			
7.00 – 8.30	Put Posters up			
7.30 – 8.30	Workshop 8 Chair: Margaret Pozzebon Venue: Adelaide Room (4th floor) Presenter: Kirrie Ballard Title: <i>The art of speaking: Converting our thoughts to sounds</i>			
8.30 – 9.00	POSTER SESSION 2 Venue: Brisbane Room			
9.00-10.30	PLENARY 3 Venue: Grand Ballroom Chair: Jennie Ponsford			
9.00 – 9.45	International Keynote Speaker: Prof Mark Sherer <i>A New Classification System for Persons with TBI in the Post-acute Period of Recovery</i>			
9.45 – 10.30	International Keynote Speaker: Prof Angelle Sander <i>Memory Strategy Training After Traumatic Brain Injury: Where We Have Been and Where We Are Going</i>			
10.30 – 11.00	MORNING TEA in Grand Ballroom Foyer and Brisbane Room			
11.00 – 12.30	CONCURRENT SESSIONS 9 – 12			
	Session 9: Psychiatric Disorders following BI and their treatment Venue: Perth Room Chair: Skye McDonald	Session 10 Using technologies to support instrumental actions in persons with executive function and memory impairments Venue: Sydney Room Chair: Brian O’Neill	Session 11: Cognitive impairment in childhood disorders Venue: Melbourne Room Chair: Megan Spencer-Smith	Session 12: Advances in memory research in healthy and pathological ageing Venue: Adelaide Room (4th floor) Chair: Muireann Irish
	Yvette Alway <i>Psychiatric Disorders in the first 5-years following Traumatic Brain Injury</i> Grahame Simpson <i>A model for suicide ideation after severe traumatic brain injury</i> Paul Gertler <i>Non-pharmacological interventions for depression in adults and children with traumatic brain injury: a systemic review</i> Jennie Ponsford <i>Psychological Therapy for Anxiety and Depression following Traumatic Brain Injury</i> Joyce Kootker <i>Effectiveness</i>	Hazel Boyd <i>An exploratory study to compare technology-based prompting formats for sequencing tasks in the home for people with dementia</i> Jon Evans <i>Supporting Diabetes Self-management in Persons with Cognitive Impairment after Acquired Brain Injury</i> Matthew Jamieson <i>A discussion of the efficacy and actual use of technological memory aids by people with memory impairments</i> Brian O’Neill <i>Efficacy of an assistive technology for executive function and</i>	Mistral Foster-Owens <i>Exploring the Behavioural & Environmental Correlates of Sleep Problems in Autism Spectrum Disorders</i> Nicci Grace <i>Motor functioning in children with Autism Spectrum Disorder: A kinematic study of handwriting</i> Ashok Jansari <i>It’s my party! Investigating Executive Impairments in Children with Atypical development (ASD & ADHD) Using a Novel Ecologically-Valid Assessment of Executive Functions</i>	Rachel Buckley <i>Autobiographical narratives relate to Alzheimer’s disease biomarkers in older adults</i> Muireann Irish <i>Memory and imagination in Alzheimer’s disease – clinical and neural correlates</i> Sicong Tu <i>Orientation dysfunction in frontotemporal dementia and Alzheimer’s disease</i> Muireann Irish <i>The neural signature of recent and remote autobiographical memory – evidence from the dementias</i> Sharon Naismith

	<i>of augmented Cognitive Behavioural Therapy for post-stroke depression with or without anxiety (PSDA): the Restore4stroke PSDA trial</i> Jill Winegardner <i>The Application of Compassion Focused Therapy following Brain Injury</i>	<i>memory after brain injury</i> Dana Wong <i>Smartphone use in individuals with traumatic brain injury (TBI), stroke, and healthy controls: Patterns of use and relationships with everyday functioning</i>	Michel Gascoigne <i>Autobiographical memory in children with epilepsy</i> Anna Adlam <i>Working memory training (Cogmed) in children who have survived a brain injury: acceptability and feasibility</i> Anna Adlam <i>Metacognition, Theory of Mind, and Children's Ability to Engage with Cognitive Behavioural Therapy</i>	<i>Rehabilitation of memory - insights from cognitive training in ageing and neurodegenerative disease</i>
12.30-1.30	LUNCH in Grand Ballroom Foyer and Brisbane Room brought to you by Shine Lawyers			
12.30-1.30	Student Lunchtime Workshop Venue: Adelaide Room (4th floor) What is it: <i>An informal lunchtime workshop will be held by an international panel of experts who will present on the following topic areas:</i> Who: ALL Students are invited Chair: Nicci Grace (ASSBI) and Coco Bernard (INS)			
	<i>An informal lunchtime workshop will be held by an international panel of experts who will present on the following topic areas:</i> <ul style="list-style-type: none"> • Registrar Program + Supervision Requirements • Applying for jobs • Professional Development Requirements • Opportunities for Australian students working Internationally (US and the UK) Guest Speakers: Prof Simon Crowe (Australia) on Registrar program, Supervision, and PD requirements Prof Margaret O'Connor (Boston, USA) on Post-doctoral opportunities in the USA Prof Jon Evans (Glasgow, UK) on Post-doctoral opportunities in the UK			
1.30 – 3.00	CONCURRENT SESSIONS 13 – 16			
	Session 13: <i>Predictors of cognitive, academic and mental health outcomes in very preterm survivors</i> Venue: Perth Room Chair: Peter Anderson	Session 14 Memory Venue: Sydney Room Chair: David Shum	Session 15 Cognitive control deficits in addiction Venue: Melbourne Room Chair: Antonio Verdejo-Garcia	Session 16 Improving functional outcomes in multiple sclerosis Venue: Adelaide Room (4th floor) Chair: Lauren Strober
	Leona Pascoe <i>Handedness and cognitive outcomes in very preterm children</i> Megan Spencer-Smith <i>Neonatal MRI is associated with future mathematical achievement in preterm children</i> Elisha Josev <i>Cerebellar-cortical connectivity contributes to working memory function in children born extremely preterm</i> Alice Burnett <i>Family functioning and mental health in adolescents born <28 weeks/<1000g compared with controls</i>	Margaret O'Connor <i>Memory Consolidation and Remote Memory: Lesion analytic and neurophysiological approaches 30mins</i> Anneli Cassel <i>Different rates of accelerated forgetting for verbal and visuo-spatial material in temporal lobe epilepsy: implications for theories of memory acquisition and consolidation</i> Eli Vakil <i>Memory for context and field dependence in patients with moderate-to-severe Traumatic Brain Injury (TBI)</i> David Man <i>Validation of 27-item Comprehensive Assessment of Prospective Memory Test (Hong Kong Chinese version) for older adults with questionable dementia</i> Grace Lee & Calvin Yip <i>Be-smart computer-assisted training for older adults with memory decline: a preliminary study</i>	Rob Hester <i>Cognitive control in the transition from nicotine use to dependence</i> Francesca Filbey <i>Combined Effects of Marijuana and Nicotine on Memory Performance and Hippocampal Volume</i> Murat Yucel <i>Repairing marijuana related brain harms</i> Antonio Verdejo-Garcia <i>Cognitive control and dorsolateral prefrontal function in patients with stimulant dependence versus pathological gambling</i>	Lauren Strober <i>Understanding the complexities of unemployment in multiple sclerosis (MS)</i> John DeLuca <i>Assessing everyday life functional activity in multiple sclerosis (MS) using actual reality</i> Peter Arnett <i>Depression and functional ability in MS</i> Hannah Gullo <i>Sensitivity of the Behavioural Assessment of Dysexecutive Syndrome (BADS) in multiple sclerosis and association with daily functioning</i>
3.00 – 3.30	AFTERNOON TEA in Grand Ballroom Foyer and Brisbane Room			

3.30 – 5.00	CONCURRENT SESSIONS 17 – 20			
	<p>Session 17: Improving outcomes after adult epilepsy surgery: From pre-surgical memory assessment to post-surgical memory rehabilitation Venue: Perth Room Chair: Sarah Wilson</p>	<p>Session 18 Facilitating successful and safe return to driving following traumatic brain injury: assessment and rehabilitation Venue: Sydney Room Chair: Rene Stolwyk</p>	<p>Session 19 Community living after Brain Impairment Venue: Melbourne Room Chair: Jenny Fleming</p>	<p>Session 20 Cognitive and emotional disturbance in psychiatric disorders and HIV Venue: Adelaide Room (4th floor) Chair: Jon Evans</p>
	<p>Bruce Hermann <i>Setting the Stage: Evolution of views of variable memory outcomes following epilepsy surgery</i> Michael Saling <i>Functional imaging protocols for assessing surgical risk to memory</i> Gregory Lee <i>Atypical language representation protects against verbal memory decline after left hemisphere epilepsy surgery in children</i> Sallie Baxendale <i>Applying the evidence: Ensuring patient informed consent</i> Laurie Miller <i>Memory rehabilitation in epilepsy: Improving post-surgical outcomes</i> Concluding remarks: Prof Sarah Wilson</p>	<p>Rene Stolwyk <i>Characterising the profile of on-road driving behaviour following traumatic brain injury</i> Adam McKay <i>Predictors of driving behaviour after TBI: Comparing cognitive tests, injury factors, and demographics</i> Margaret O'Connor <i>DriveWise: Identification of and Support for Medically Impaired Drivers</i> James Gooden <i>Self-awareness and self-regulation of on-road driving following traumatic brain injury</i> Pamela Ross <i>Driver rehabilitation following traumatic brain injury</i> Discussant: Prof Jennie Ponsford</p>	<p>Lucy Knox <i>I'm considered unable to make decisions...not capable: The subjective experience of decision making after severe TBI</i> Jacinta Douglas <i>Improving communication-specific coping after traumatic brain injury: Evaluation of a new treatment using single case experimental design with replication</i> Robyn L. Tate <i>Which interventions are effective in improving meaningful occupation after traumatic brain injury? A systematic review and recommendations for clinical practice</i> Sue Sloan <i>Embedding slow stream rehabilitation within a transitional housing and support model for people with severe cognitive behavioural impairment</i> Rebecca Wood <i>Using technology in supported accommodation to improve outcomes following acquired brain disorders</i> Libby Callaway <i>Assisting young people in residential aged care to access the National Disability Insurance Scheme</i></p>	<p>Breda Cullen <i>Cognitive function and lifetime features of depression and bipolar disorder in a large population sample: cross-sectional study of 143,828 UK Biobank participants</i> Melissa Chauvet <i>Fear circuitry function in anxious youths, youths at familial risk for anxiety disorders and healthy youths: an fMRI study</i> Hirosha Jayaweera <i>Spectroscopic markers of memory impairment, symptom severity and age of onset in older people with lifetime depression: Role of N-acetyl aspartate and glutamate</i> Sean B. Rourke <i>Asymptomatic Neurocognitive Impairment (ANI) is associated with progression to symptomatic HIV-associated Neurocognitive Disorders (HAND) in people with HIV: Results from the Ontario HIV Treatment Network (OHTN) Cohort Study</i> Lucette Cysique <i>Chronicity and recurrence of depression are key factors in whether depression affects neuropsychological performance in HIV-infected persons</i> Sean B. Rourke <i>Validity of four neurocognitive screening tests for HIV-associated Neurocognitive Disorders (HAND): Preliminary results of sensitivity, specificity, and classification accuracy</i></p>
5.00 – 6.30	Student Presentation – Panel of Experts			
	<p>Venue: Sydney Room Chair: Nicci Grace and Coco Bernard What is it? A panel of expert clinicians from varying backgrounds in speech pathology and neuropsychology will present on multi-disciplinary approaches to assessment and rehabilitation of individuals with language/communication disorders following stroke and/or traumatic brain injury. There will be a focus on how different disciplines (e.g., speech therapy and neuropsychology) can work together more effectively in rehabilitation settings. Panel Members: Prof Jacinta Douglas (Dually trained Neuropsychologist and Speech Pathologist) Prof Skye McDonald (Neuropsychologist) Prof Leanne Togher (Speech Pathologist)</p>			
5.00 – 6.00	<p>INS Business Meeting Venue: Perth Room Chair: Ann Watts INS</p>			
7pm onward	Student Social Networking Event			
	<p>ALL students invited. Supported by INS, ASSBI, Brain Sciences UNSW and Menzies Health Institute QLD Venue: Buckley's, Suite 18, 7 Macquarie Street, Circular Quay www.buckleyssydney.com.au Meet up: All students wishing to walk together to the social event are asked to meet at 'Student's Corner' in the Canberra Room at 6.45pm</p>			

FRIDAY ABSTRACTS

Workshop 8

The art of speaking: Converting our thoughts to sounds

Ballard, Kirrie J.^{1,2}

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The ability to express needs, wants, humour, sarcasm, opinions, political ideals, through speech is fundamentally and uniquely human. A full account of how we convert our thoughts to speech movements and produce speech sounds is critical to our understanding how speech has evolved, how it develops in children, and how it degrades with aging and neurological damage. The condition of apraxia of speech (AOS) offers a unique window into this process: it occurs in both developmental and acquired conditions, arising from damage to the left inferior frontal cortex where speech is thought to be generated. Individuals with AOS can generate the words and sentences to express their thoughts but experience difficulty converting these representations into movements and sounds. They report that they must speak one syllable at a time, with their speech characterized by distorted sounds, effortful struggling to place lips and tongue in correct positions, and disrupted speech rhythm. Advances in neural imaging and computational models of cognition and motor control have triggered a new era of experimentation linking with theoretical developments. Perspectives from these approaches are elucidating the nature of the impairment in apraxia of speech as well as providing insights into how we speak.

Learning Objectives:

At the end of this workshop, participants should be able to:

1. Discuss the role of FOXP2 in evolution of speech production
2. Describe the stages in converting a thought or concept into well-articulated speech
3. Recognize cognitive-linguistic skills and errors versus motor-speech skills and errors
4. Predict the impact on speech production of damage to different components of the speech motor network
5. Explain how the disorder of apraxia of speech informs studies of speech production and development.

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Plenary Session 3

A New Classification System for Persons with TBI in the Post-acute Period of Recovery

Sherer, Mark¹

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Background and aims: Traumatic brain injury (TBI) has been classified based on severity and duration of impairment of consciousness using the Glasgow Coma Scale (GCS). While GCS scores are useful in guiding early medical management, they are not useful for treatment planning in the post-acute period. Further, persons with the same initial GCS scores may have different outcomes.

Method: A large cohort of community dwelling persons with TBI was administered cognitive tests, performance validity measures, and questionnaires. A cluster analysis of these scores derived 12 dimensions that can be used to characterize persons with TBI. Scores on these 12 dimensions were submitted to cluster analysis to derive groups of persons with TBI who were similar to each other. A group of TBI experts developed case conceptualizations and treatment recommendations for each cluster.

Results: There were 504 persons with TBI who participated in the study. 12 dimensions of patient experience were derived. These were Memory, Cognitive Processing Speed, Verbal Fluency, Self-reported Cognitive Symptoms, Independence and Self-esteem, Resilience, Emotional Distress, Post-concussive Symptoms, Physical Symptoms, Physical Functioning, Economic and Family Support, and Performance Validity. Cluster analysis of the 504 participants resulted in 5 groups of persons with TBI. Group 1 consisted of persons with relatively normal cognitive functioning and very few complaints. Persons in Group 2 also had normal cognitive functioning but had more complaints. Persons in Group 3 had significant cognitive impairment but few complaints. Persons in Group 4 had minimal cognitive impairment, but a substantial number of complaints. Persons in Group 5 failed performance validity testing.

Conclusion: This new classification scheme based on cognitive functioning and a wide range of aspects of patient experience has potential to inform case conceptualization and treatment recommendations for persons with TBI.

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Memory Strategy Training After Traumatic Brain Injury: Where We Have Been and Where We Are Going

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Research has demonstrated limited generalizability of memory strategy training beyond the rehabilitation setting, partly due to inflexibility in the application of strategies across settings and functional memory problems. The aim of this presentation is to contrast the traditional, center-based approach to memory strategy training with a contextualized training approach conducted in participants' homes, using individualized goals and strategy choices, and accounting for participant preferences and resources. The treatment approach from an ongoing randomized controlled trial comparing traditional memory notebook training to contextualized memory strategy training will be discussed, along with examples of implementation from participants who have completed the trial.

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Concurrent Session 9 – Psychiatric Disorders following BI and their treatment

Psychiatric Disorders in the first 5-years following Traumatic Brain Injury

Alway, Yvette^{1,3}; Gould, Kate^{1,3,4}; Johnston, Lisa³; McKenzie, Dean² and Ponsford, Jennie^{1,3,4}

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Background and aims: Psychiatric disorders commonly emerge during the first year following traumatic brain injury (TBI). However, it is not clear whether these disorders soon remit or persist for long periods postinjury. This study aimed to examine, prospectively: 1) the frequency, 2) patterns of comorbidity, 3) trajectory, and 4) risk factors for psychiatric disorders during the first five-years following TBI.

Method: Participants were 203 individuals (78.8% male) with predominately moderate (29.2%) or severe (66.2%) TBI. Psychiatric disorders were diagnosed using the Structured Clinical Interview for DSM-IV (SCID-I), administered soon after injury and 3, 6, and 12 months and 2, 3, 4, and 5 years postinjury. Disorder frequencies and generalised estimating equations were used to identify temporal relationships and risk factors.

Results: Overall, 67.5% received a psychiatric diagnosis postinjury, which typically emerged during the first year (83.1%). 66.4% of cases had a preinjury psychiatric history. Anxiety, mood and substance-use disorders were the most common diagnoses, often presenting comorbidly. Disorder frequency ranged between 55.7 and 35.6% during the first five-years, with disorder likelihood decreasing by 22% (95% CI: 0.71-0.90) with each year postinjury. The likelihood of anxiety (95% CI: 0.67-0.88) declined significantly over time, whilst mood and substance-use disorders did not. The strongest predictors of postinjury disorder were preinjury disorder (95% CI: 1.57-4.31) and accident-related limb injury (95% CI: 1.12-3.10).

Conclusions: Findings suggest that the first year postinjury is a critical period for the emergence of psychiatric disorders. Disorder frequency declines thereafter, with anxiety emerging and resolving earlier than mood and substance-use disorders.

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A model for suicide ideation after severe traumatic brain injury

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Background and objectives: The risk of suicide ideation (SI) after severe traumatic brain injury (TBI) is double the level of the general population. Little is known about the underlying mechanisms that could account for the elevated risk. This study aimed to develop an explanatory model of SI after severe TBI, based on the interaction among distal and proximal risk factors, protective factors and SI.

Method: Participants (n=90) with severe TBI (Post Traumatic Amnesia > 7 days) from the Liverpool Brain Injury Rehabilitation Unit in Sydney Australia completed a battery of neuropsychological tests and self-report measures. Treating staff also completed clinician-rated measures. Data were analysed using structural equation modelling.

Results: The model demonstrated good fit indices. Distal risk factors including post-injury aggression and impairments in problem-solving had direct and indirect links to depression (a proximal risk factor), which in turn mediated their relationship to hopelessness and SI. There was also a direct link between poor problem-solving and SI. Protective factors including social support, hope, community participation and self-esteem mediated the relationship between distal/proximal risk factors, hopelessness and SI.

Conclusion: The current model is the first to demonstrate the direct and indirect effects of risk factors and protective factors associated with SI after severe TBI. The model can now be tested prospectively to evaluate its predictive validity.

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Non-pharmacological interventions for depression in adults and children with traumatic brain injury: a systemic review

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Background and aims: Following traumatic brain injury (TBI) there is an increased prevalence of depression compared to the general population. It is unknown whether non-pharmacological interventions (NPI) for depression are effective in the TBI population. The aim was to investigate the effectiveness of NPI for depression in adults and children with TBI.

Methods: Eight electronic databases, three trial registries and hand searches of relevant journals and conference proceedings were systematically reviewed. Only randomised controlled trials were included. Two authors independently selected trials from the search results, then assessed methodological quality and extracted data from the included trials. The authors contacted trial investigators to obtain missing information.

Results: Six trials were identified that met the selection criteria with a total of 334 adult participants. No studies were identified that included children as participants. The interventions were repetitive transcranial magnetic stimulation (rTMS) combined with a tricyclic antidepressant (TCA), supervised exercise program and three psychological interventions: cognitive behaviour therapy (CBT), mindfulness-based cognitive therapy (MBCT) and supportive psychotherapy (SPT). The most effective treatment was rTMS plus TCA which was more effective than TCA alone for scores on the Hamilton Scale for Depression. Three studies evaluating CBT or MBCT in comparison with a no-treatment control were combined in a meta-analysis. This found a statistically significant but modest effect in favour of intervention. One study that compared CBT with SPT found a very small significant effect in favour of CBT.

Conclusions: The review found evidence of the effectiveness of rTMS plus TCA and some support for two psychological interventions, CBT and MBCT. Further research is needed to replicate these findings, to provide long-term follow up data and to compare active conditions.

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Psychological Therapy for Anxiety and Depression following Traumatic Brain Injury

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Background and Aims: Anxiety and depression are frequently experienced following TBI, often comorbidly. Effective psychological treatments are needed. This study aimed to evaluate the impact of a cognitive behavioural therapy (CBT) treatment program adapted for individuals with moderate-severe TBI on anxiety, depression and psychosocial outcome. Motivational Interviewing (MI) was also evaluated as a preparatory intervention to increase motivation and engagement in treatment.

Method: Participants were screened for anxiety and depression using the Structured Clinical Interview for DSM-IV. Seventy-five individuals with TBI (mean age 42.2 years, mean PTA 22 days) were randomly assigned to one of three conditions, (1) MI+CBT (n=26), (2) Non-directive counselling +CBT (n=26) (Treated groups) and (3) treatment as usual (TAU) (control) (n=23). Groups did not differ in baseline demographics, severity of injury, depression, anxiety or cognitive function. Manuals guided the 3-week MI and 9-week CBT interventions delivered by clinical

psychologists/neuropsychologists. Three CBT booster sessions were provided during follow-up.

Results: 30-week follow-up was completed by 68 participants. Using random effects regressions controlling for baseline scores, the Treated groups showed a significantly greater reduction in anxiety on the Hospital Anxiety and Depression Scale (HADS) and a significantly greater reduction in depression on the Depression Anxiety and Stress Scale over 30-weeks post-baseline relative to the TAU control group. The Treated groups also showed significantly greater gains in psychosocial functioning on the Sydney Psychosocial Reintegration Scale (SPRS) than TAU controls at 30 weeks. Higher baseline anxiety and depression were associated with greater response. The group receiving MI did not show greater gains than the group receiving CBT only.

Conclusions: The findings suggest that modified CBT with booster sessions results in a gradual and significant reduction in anxiety and depression following TBI.

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Effectiveness of augmented Cognitive Behavioural Therapy for post-stroke depression with or without anxiety (PSDA): the Restore4stroke PSDA trial

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Background and aims: Currently there is no evidence-based psychological treatment for Post-Stroke Depression with or without Anxiety (PSDA). We conducted a randomized controlled trial to evaluate the effectiveness of augmented, activation-based and individually-tailored Cognitive Behavioural Therapy (CBT) for post-stroke depression and anxiety. Our intervention was based on the principles of recognizing, registering, and altering negative thoughts and cognitions so that mood and emotional symptoms would be improved. CBT was augmented with direct in-vivo activation offered by occupational or movement therapists.

Methods: A multi-centre, assessor-blinded, randomized controlled trial was conducted. Stroke patients who were eligible (>3 months post stroke; Hospital Anxiety and Depression Scale-Depression>7) were randomly allocated to either the augmented CBT intervention (n=30) or a control intervention (computerized cognitive training Cogniplus) (n=31). Outcome measurements were performed at baseline, directly post treatment and at 4 and 8 months follow-up. Primary outcome measure was the HADS; secondary outcomes participation and quality of life.

Results: Mixed model analyses showed no significant differences between the groups on any of the outcome measures. There was, however, a significant time effect for both treatments.

Conclusions: Augmented CBT was not superior to Cogniplus for reducing post-stroke depression. Given the positive effects

of both interventions on depression, future studies should further investigate the effective treatment elements.

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The Application of Compassion Focused Therapy following Brain Injury

Paper to be given by Jill Winegardner

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Background and aims: Anxiety and depression are significant after acquired brain injury (ABI), yet the evidence base for treatment options is relatively limited. Self-criticism and shame can be common experiences associated with depression and anxiety following brain injury. Compassion Focused Therapy (CFT) was developed to target shame and self-criticism. This paper will describe how psychological problems following brain injury, underpinned by shame and self-criticism, can be alleviated through CFT. We highlight adapting this new model of treatment to the ABI population.

Methods: A mixed-methods design of 12 participants attending holistic neuropsychological rehabilitation will be presented. CFT was integrated into the holistic rehabilitation programme. The Hospital Anxiety and Depression Scale (HADS) and the Forms of Self-Criticising and Self-Attacking Scale (FSCRS) were administered before and after intervention and at 3 months follow-up. The aims were to decrease self-criticism and symptoms of anxiety and depression as well as increase participants' capacity to be self-compassionate. After follow-up, interviews were conducted with six participants and analysed using interpretative phenomenological analysis to gain a richer understanding of the role of CFT.

Results: Scores on the HADS and FSCRS changed significantly from start to the end of the programme and were maintained at 3 months follow-up, indicating positive change. Qualitative analysis mirrored quantitative results and highlighted beneficial elements of CFT in the change process.

Discussion and Conclusions: Preliminary findings suggest CFT can be used to alleviate depression and anxiety associated with self-criticism and shame following ABI. Additionally, CFT works well in the context of a holistic rehabilitation programme.

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Concurrent Session 10 – Using technologies to support instrumental actions in persons with executive function and memory impairments

An exploratory study to compare technology-based prompting formats for sequencing tasks in the home for people with dementia

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²University of Bath, UK

³Brain Injury Rehabilitation Trust, UK

Background and objectives: People with dementia can lose the ability to carry out everyday tasks at home as their executive function diminishes. Prompting using technology could support this. The objectives were: to investigate the relative effectiveness of different formats of technology-based

prompting for people with dementia during multi-step tasks in the home; and to explore related aspects of task prompting that should be understood in order to inform the design of prompting technology.

Research questions: Which formats are effective for providing technology-based prompting to people with dementia during multi-step tasks, and why? What else affects the success of such prompting technology?

Method: n=9 participants (5M/4F) with mild to moderate dementia were recruited, each with a carer. Four formats of prompt (text, recorded voice, picture and video) were trialled during home visits, using a card-and-envelope task and a portable-cd-player task as set tasks. The trials were video recorded and a scoring system was developed to compare the level of task completion between the formats. Individual tasks were also studied in an exploratory way.

Results: Text and audio prompts were each more effective than video or picture prompts during the card-and-envelope task ($p < 0.01$), but this difference was not seen in the CD player task. Exploring individual tasks highlighted the importance of familiarity, language and deconstructing tasks effectively.

Conclusions: This study showed that the effectiveness of prompting technology relies on factors including the type of action in the task, the language used in verbal prompts, and the ability of carers to deconstruct tasks.

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Supporting Diabetes Self-Management in Persons with Cognitive Impairment after Acquired Brain Injury

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²Brain Injury Rehabilitation Trust, Glasgow, UK

Background and aims: Individuals with cognitive impairment arising from acquired brain injury (ABI) often require support to complete diabetes self-management tasks through verbal guidance provided by carers. GUIDE, developed by O'Neill and Gillespie (2008), is an automated verbal prompting system which aims to replicate the verbal guidance often provided to individuals with cognitive impairment by carers. The aim of this study was to investigate whether GUIDE can improve the ability of individuals with cognitive impairment to self-manage their diabetes.

Methods: We conducted a Single Case Experimental Design (SCED) study with two participants with a diagnosis of diabetes and ABI. A multiple-baseline ABA (Baseline, Intervention, Return to baseline) design with randomized baseline length was used. The outcome measures were (1) the number of prompts required to successfully check blood sugar levels, (2) number of steps sequenced correctly and (3) number of errors.

Results: Data analysis was conducted using Non-Overlap of All Pairs. Use of GUIDE significantly reduced the level of staff prompting needed for task completion when compared to baseline for both participant 1 (NAP = 0.97, $p < .05$) and participant 2 (NAP = 0.95, $p < .01$). For participant 2 the intervention also increased the proportion of the task that was sequenced correctly (NAP = 1.0, $p < .01$).

Conclusions: GUIDE appears to be useful in supporting diabetes self-management in people with ABI and could potentially be used more widely to support individuals with cognitive impairment (e.g. dementia, learning disability) and to support other complex behavioural sequences.

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A discussion of the efficacy and actual use of technological memory aids by people with memory impairments

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Background and aims: Prompting devices which assist prospective memory and micro-prompting devices which assist performance of tasks with several sub-steps have the potential to compensate for memory impairment. In two studies we ask: 1) Is there evidence for the efficacy of either devices? and 2) Are they actually used by people with memory impairments?

Method: Study 1: A systematic search was performed for all studies that investigated the impact of technology on memory performance for adults with impaired memory resulting from acquired brain injury (ABI) or degenerative disease (43 papers, including 7 group studies suitable for meta-analysis and 17 single case experimental design (SCED) studies suitable for re-analysis). Study 2: 179 people with memory impairments (ABI n=81, dementia n=98) completed a memory aid technology checklist.

Results: Study 1: A meta-analysis of the efficacy of prompting technology vs. control gave a large effect size ($d=1.27$, $n=147$). Non-overlap of All Pairs analysis gave a large mean effect size of 0.94 for the SCEDs investigating micro-prompting devices (14 cases, 8 papers). Study 2: The most commonly used technologies were mobile phone reminders (38% ABI group; 8% dementia group) and alarms/timers (38% ABI; 10% dementia). People with ABI reported using significantly more technology to aid their memory than people with dementia ($t=59.5$, $df=177$, $p < 0.01$).

Conclusions: There were more efficacy studies of prompting devices than micro-prompting devices and both were shown to be effective in the studies analysed. All of the technologies most commonly used by survey responders were prompting devices. There is good evidence for the efficacy of reminding technology for people with ABI and technology uptake is increasing. There is a need for investigations into the use of memory aid technology for people with degenerative diseases because there have been few efficacy studies and there is limited uptake by this group.

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Efficacy of an assistive technology for executive function and memory after brain injury

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Background and aims: Difficulties sequencing actions to achieve goals typify executive dysfunction after brain injury. Guide is an interactive audio prompting system that emulates the supportive questions and prompts of carers. We aimed to clinically trial Guide in scaffolding the complex sequences of the morning routine and laundry.

Research questions: Does cognition predict sequence performance? Does interactive verbal scaffolding improve task performance? Does interactive verbal scaffolding facilitate learning sequences?

Method: n=40 participants with severe acquired brain injury (73% traumatic) were randomised to Guide or neurobehavioural rehabilitation as usual. Indices of neuropsychological function were taken. Outcomes were study specific sequence performance scales which recorded numbers of (1) support worker interventions, (2) errors made, (3) sequence deviations and (4) user satisfaction.

Results: The sample had average premorbid IQ; borderline

language and visuospatial function; and extremely low range memory and executive function. Baseline errors were predicted by a model composed of executive function, memory and anxiety ($F_{3,16}$; $p < 0.001$; $R^2 = 0.77$). For the morning routine, in test, the Guide group required fewer support worker prompts ($z = 1.96$, $p = 0.050$); made fewer errors per trial ($z = 3.097$, $p = 0.002$) and made fewer deviations from the sequence ($z = 2.256$, $p = 0.024$). For the laundry task, baseline inequality led to an underpowered comparison. There was a tendency for a learning effect on this novel task. Guide users tended to make fewer errors at return to baseline ($z = 1.734$, $p = 0.083$). Guide users' satisfaction dropped after return to baseline.

Conclusions: The study allowed development of an efficacious rehabilitation tool. Studies of support of other behavioural sequences in different populations are warranted.
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Smartphone use in individuals with traumatic brain injury (TBI), stroke, and healthy controls: Patterns of use and relationships with everyday functioning

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Background and Aims: Smartphones have great potential as a tool to support rehabilitation following acquired brain injury (ABI). The aim of this study was to investigate patterns of smartphone use among individuals with TBI and stroke compared with controls, identify the barriers to effective smartphone use, and examine the relationships between smartphone use and cognitive, emotional, and psychosocial functioning.

Method: Twenty-nine participants with TBI were matched on age and education with 33 healthy control participants, and 23 participants with stroke were matched with 20 controls. All completed a smartphone survey developed for this study, and measures of concurrent functioning (*RAVLT*, *Cognitive Failures Questionnaire*, *DASS*, and *Community Integration Questionnaire*).

Results: Current smartphone use was equally common in participants with TBI and controls, but less common in stroke survivors. The frequency of use of different types of apps was fairly similar between groups. Barriers to effective smartphone use included forgetting how to use the smartphone. Difficulty learning new technology was identified by older participants with stroke. Only a minority of participants with ABI reported that smartphone use had been suggested or demonstrated by rehabilitation therapists. Within participants with TBI and stroke, there were a number of significant associations between higher frequency of app use and better cognitive, social and emotional functioning; these relationships were not seen in controls.

Conclusions: Smartphones are accessible and commonly used by people with ABI, and more frequent use is associated with better everyday functioning. Smartphones are potentially effective rehabilitation tools if adequate support can be provided during the learning process.

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Concurrent Session 11 – Cognitive impairment in childhood disorders

Exploring the Behavioural & Environmental Correlates of Sleep Problems in Autism Spectrum Disorders

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Background & aims: Children with Autism Spectrum Disorder (ASD) experience sleep problems at a disproportionately high rate to typically-developing (TD) children.¹⁻³ Whilst several biological, psychological, & environmental factors have been proposed to play a causative role in the occurrence of sleep problems in this population, the underlying aetiology of sleep difficulties in children with ASD remains unknown.⁴ The present study aimed to explore the relationship between unique features of the ASD sleep profile with several behavioural & environmental factors.
Methods: Sleep in 34 children aged 6-12 years with ASD was compared to 34 age- & gender-matched TD children using 14 nights of actigraphic monitoring & the Children's Sleep Habits Questionnaire (CSHQ). Parents also completed the Social Responsiveness Scale, the Strengths & Weakness of ADHD symptoms & Normal behavior scale, the Developmental Behaviour Checklist, & the Bedtime Routines Questionnaire.

Results: Group comparisons showed that the ASD group had significantly greater parent-reported difficulty across all areas of the behavioural (CSHQ) sleep profile, & significantly longer actigraphic sleep-onset latency (SOL), than the TD group. Correlational analyses showed that shorter weekday actigraphic SOL was significantly correlated with greater hyperactivity in the ASD group. Higher levels of behavioural & emotional disturbance, more hyperactive behaviour, less consistent & more maladaptive bedtime routines, & older age, were significantly associated with a number of parent-reported sleep problems in children with ASD.

Conclusions: While difficulties in sleep initiation in children with ASD has been reinforced as a core feature of the ASD sleep profile through actigraphic monitoring, the underlying aetiology for this difficulty remains unclear after examination of several behavioural & environmental factors. In contrast, greater parent-reported difficulty in several aspects of the behavioural sleep profile in ASD appears to be linked to a combination of child age, increased levels of emotional & behavioural difficulties, higher levels of hyperactivity/impulsivity, & less consistent & more maladaptive bedtime routines. Future research should seek to explore other potential causes of objectively-measured sleep-onset issues in children with ASD. In doing so the underlying causal pathways may be identified, & more effective treatment & intervention subsequently applied in their management.

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Motor functioning in children with Autism Spectrum Disorder: A kinematic study of handwriting

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Background and Aims: Motor functioning is well known to be impaired in children with autism spectrum disorder (ASD), however the neuromotor profile is yet to be fully characterised. Handwriting is commonly identified as an area of weakness within school-aged children with ASD, with many children referred to occupational therapists for assistance with these impairments. The aim of this kinematic study is to increase understanding of the neuromotor profile of autism by evaluating handwriting movements, which are a model task for assessing how base motor plans are controlled and generalised.

Participants and Methods: Participants aged between 8-12 years ($N=55$, $M=10.80(1.13)$ years) included 24 ASD children ($IQ>75$) and 31 typically developing (TD) children. Overall motor functioning was indexed using the Movement Assessment Battery for Children (MABC-2). Handwriting performance was based on an adapted subtest of the Handwriting Performance Test, where children wrote the phrase “cat and dog” five times on a digitized Wacom tablet. Kinematic data per movement was extracted using the software MovAlyzeR based on an automated segmentation algorithm.

Results: Consistent with previous research, results indicate significantly poorer motor skills in the ASD group compared to the TD group (MABC-2, $p<0.05$). Children with ASD also appeared to show a unique handwriting profile which was characterized by significantly greater transition time between movements ($p<0.01$) and inefficient writing (indexed by movement trajectory) ($p<0.05$), compared to the TD group.

Conclusions: Overall, children with ASD appear to have more inefficient writing compared to typically developing children. This is consistent with broader motor impairments commonly observed in the ASD population that have previously been linked to fronto-striatal dysfunction. The current findings provide a framework for better understanding the motor difficulties that are commonly identified in the child ASD population, specifically with handwriting, and provide a foundation for important intervention strategies in this population across educational settings.

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It's my party! Investigating Executive Impairments in Children with Atypical development (ASD & ADHD) Using a Novel Ecologically-valid Assessment of Executive Functions.

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Background and Aims: We aimed to evaluate the ability of a new ecologically-valid assessment, the Jansari assessment of Executive Functions for Children (JEF-C[©]) for discriminating between typically developing children (TD) and those with

Autistic Spectrum Disorder (ASD) or Attention Deficit Hyperactivity Disorder (ADHD).

Method: We used an experimental design with children in three age-matched groups: TD ($N=64$), ASD ($N=18$) and ADHD ($N=11$). JEF-C[©] involves the child running a make-believe party in a virtual-reality computer-based environment resembling a game mimicking aspects of the Multiple Errands Task (MET). It concurrently evaluates eight constructs central to executive function: Planning, Prioritisation, Selective-Thinking, Creative-Thinking, Adaptive-Thinking, Action-Based Prospective Memory (PM), Event-Based PM and Time-Based PM. In addition to JEF-C[©], participants completed the Six Parts test of the Behavioural Assessment of Dysexecutive Syndrome in Children (BADSD-C) and parents completed the Behaviour Rating Inventory of Executive Functions (BRIEF).

Results: A one-way MANOVA on the compound JEF-C[©] performance revealed a main effect of group ($F(18,164)=1.971$, $p=0.014$, Wilks $\lambda=0.676$ (η^2 of 0.178) with the power to detect the effect high (.970)). The TD group outperformed both the ASD and ADHD groups. JEF-C[©] was more sensitive at discriminating between the three groups than the BADSD-C and revealed a pattern that paralleled the subjective BRIEF parent evaluations.

Conclusions: JEF-C[©] shows great potential for becoming a standard assessment of childhood executive functions and for assessing difficulties associated with atypical development. Since the assessment provides performance on eight measures, future research aims to evaluate how the profiles can be used to develop individualised support programmes to help the children.

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Autobiographical memory in children with epilepsy Gascoigne, Michael¹; Smith, Mary Lou²; Barton, Belinda³; Webster, Richard⁴; Gill, Deepak⁴ & Lah, Suncica^{1,5}

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Background and aims: Recall of personally experienced events involves recall of event specific information (episodic memory) and facts (semantic memory). The ability to recall autobiographical events relies on the integrity of a distributed brain network. In adults, temporal lobe epilepsy (TLE) has been associated with impaired recall of event specific information. Little is known, however, about autobiographical memory in children with epilepsy, which was examined in the current study.

Method: Twenty-one children with TLE, 18 with idiopathic generalised epilepsy (IGE) and 42 controls were administered the Children's Autobiographical Interview (CAI; Free Recall and Specific Probe conditions) that provided separate scores for episodic and semantic details.

Results: Kruskal-Wallis tests revealed significant between-group differences for episodic recall during Free Recall and Specific Probe conditions ($p=0.02$ and 0.003 , respectively) but not for semantic recall ($p=0.41$ and 0.27 , respectively). Compared to controls, the TLE group recalled fewer episodic details in the Free Recall condition ($p=0.04$), while the IGE group recalled fewer episodic details in both the Free Recall ($p=0.02$) and Specific Probe conditions ($p=0.001$). Age correlated with Free Recall among controls ($r=0.50$, $p=0.001$), but not in children with either IGE ($r=0.34$, $p=0.11$) or TLE ($r=0.41$, $p=0.09$).

Conclusions: In children with epilepsy recall of autobiographical memory is selectively impaired (involves episodic, but spares semantic details) irrespective of the site of epilepsy focus. Thus it appears that even in the absence of temporal lobe pathology/seizure focus generalised seizures alone could compromise memories for personally-experienced events.

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Working memory training (Cogmed) in children who have survived a brain injury: acceptability and feasibility

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Background and aims: Working memory (WM) is essential for new learning and difficulties in childhood can result in a failure to engage in education, participate in meaningful activities, and achieve future employment. Impairments in WM are common following paediatric acquired brain injury (pABI). Research has demonstrated that children can show WM gains following computerised training (Cogmed). To date, no studies have investigated whether children with pABI benefit from Cogmed. The current study aimed to assess the feasibility and acceptability of delivering Cogmed to children with pABI, aged 8-16 years.

Methods: Twenty-six children were randomised to either adaptive (n=12) or non-adaptive (n=14) home-based Cogmed training. Parents and children completed acceptability questionnaires. The criterion for sufficient treatment completion was defined as completing 20 or more training sessions.

Results: The groups were comparable at baseline for age, IQ, sex, and SES. It took on average 9-weeks to complete adaptive training, with 75% of children reaching treatment completion criterion (only 50% of children reached treatment completion in the non-adaptive control condition over 7-weeks). Parents and children gave high ratings for satisfaction and ease-of-use, and parents found it easier to motivate their child at the beginning compared to the end of training.

Conclusion: Children with pABI and their parents found Cogmed acceptable and accessible. Findings suggest that children with pABI might require Cogmed to be delivered over a longer period than the standard 5-weeks protocol to complete treatment. Future RCTs might benefit from enhanced motivational features to maintain engagement in the non-adaptive control condition.

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Metacognition, Theory of Mind, and Children's Ability to Engage with Cognitive Behavioural Therapy

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Background and aims: Cognitive Behavioural Therapy (CBT) is often the treatment of choice for mental health

conditions in childhood. There is, however, a debate concerning the efficacy of CBT for children, in particular whether children have the necessary cognitive and affective skills to engage in CBT. It has been suggested that metacognition and theory of mind (ToM) must be appropriately developed for children to engage with CBT. These two processes share common properties and previous research has documented a positive relationship between them. The present study aimed to investigate the relationship between metacognition, ToM, and the ability to engage in CBT in 59 typically developing children aged 8-11 years.

Method: Children's ability to engage with CBT was assessed using two CBT tasks: a thought/feeling/behaviour discrimination task, and a thought-to-feeling and thought-to-behaviour linking task. Metacognitive ability was assessed using a feeling-of-knowing metamemory task, ToM ability was assessed using a higher-order false-belief task and empathy was measured using the parent-report Children's Empathy Quotient (EQ-C).

Results: All children demonstrated some understanding in the CBT tasks. Metacognition and empathy significantly predicted performance on the linking task. Counter to predictions, there was no significant relationship between metacognition and ToM.

Conclusions: Children have sufficiently developed cognitive and affective capacities to engage with CBT by the age of 8. Children's ToM may not be sufficient to understand someone's rich emotional state. Instead, children may use empathy to imagine themselves in another person's situation and metacognitive processes to elucidate their mental state.

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Concurrent Session 12 – Advances in memory research in healthy and pathological ageing

Autobiographical narratives relate to Alzheimer's disease biomarkers in older adults

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Background and aims: Autobiographical memory (ABM) refers to the recollection of highly contextualised individual experiences, while personal semantic memory (PSM) refers to shared but personally relevant facts about the individual. MCI is routinely diagnosed with the aid of standard tests of learning and retention, which do not tap the personal memory

domain. We aimed to determine whether individuals with MCI differ from healthy older adults (HOA) on measures of ABM and PSM, and whether these measures relate to Alzheimer's disease (AD) neuroimaging biomarkers. **Method:** 124 participants (HOA = 80; MCI = 24) were recruited from the Australian Imaging Biomarkers and Lifestyle (AIBL) study, and completed the Episodic ABM Interview. Thirty-one participants (HOA=22; MCI=9) underwent β -amyloid positron emission tomography and magnetic resonance imaging. Overall neocortical β -amyloid burden was analysed, along with grey matter and hippocampal volume.

Results: ABM and PSM recall was impaired in MCI, after accounting for age and depressive symptomatology. ABM did not relate to either neocortical β -amyloid burden or brain volume (grey matter or hippocampal), however PSM was related to amyloid burden after adjusting for age and *APOE* ϵ 4 status.

Conclusions: ABM and PSM are reduced in MCI participants, with a larger effect size for ABM recall. ABM does not relate to neocortical amyloid burden, suggesting that personal memory systems are impacted by differing disease mechanisms, rather than being uniformly underpinned by β -amyloid. Episodic and semantic components of ABM impairment in MCI represent an important AD prodrome.

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Memory and imagination in Alzheimer's disease – clinical and neural correlates

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Background and aims: Episodic memory dysfunction represents a hallmark clinical feature of Alzheimer's disease (AD). Mounting evidence suggests that the ability to imagine the future is also compromised in this syndrome, yet the mechanisms underlying these deficits remain unclear. Here, we investigated the capacity for imagination of fictitious scenes in patients with AD, with a view to establishing its clinical and neural correlates.

Method: Fourteen AD patients were tested on the Scene Construction task and their performance was compared to 14 healthy older Controls. Participants were required to mentally construct and describe in detail 7 commonplace scenes (e.g., Beach, Museum). Narratives were coded for level of contextual detail and spatial coherence. Participants completed a battery of standard neuropsychological tests and a whole-brain structural MRI scan.

Results: Scene construction performance was significantly compromised in AD in terms of contextual details, spatial coherence, and overall richness of the scene. Correlation analyses failed to find an association between standard neuropsychological tests of episodic memory and scene construction performance. Voxel-based morphometry analyses revealed that integrity of the posterior cingulate cortex related to scene construction performance in AD.

Conclusions: Our study reveals marked impairments in the ability to imagine fictitious scenes in AD attributable to damage to the posterior cingulate cortex, a critical node of the core memory network. Our findings accord with a growing body of evidence which implicates the degeneration of the posterior cingulate cortex across a range of cognitive deficits

typically seen in AD, in domains such as remembering the past, imagining the future, and spatial orientation.

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Orientation dysfunction in frontotemporal dementia and Alzheimer's disease

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Background and aims: Spatial disorientation is an early warning sign of Alzheimer's disease along with characteristic impairments in episodic memory. Orientation, specifically the ability to maintain heading direction, is subserved by posterior parietal structures of the brain, typically affected in Alzheimer's disease (AD) but not frontotemporal dementia (FTD). In the current study, a novel virtual supermarket task was used to objectively measure orientation performance with the aim of evaluating: i) the diagnostic sensitivity of orientation in AD and FTD patients, and ii) the underlying neural correlates of spatial disorientation.

Method: Spatial orientation performance was assessed in 20 AD, 38 FTD, and 23 age- and education-matched controls. Briefly, participants were shown a series of videos set in a virtual supermarket environment and explicitly asked to maintain heading direction of the starting point from the finishing location. All participants were given a battery of cognitive tests to assess memory function and a whole-brain structural MRI scan.

Results: Despite evidence of memory impairment across standard cognitive tests in both patient groups, orientation was significantly impaired in AD patients while FTD patients performed at the same level as controls. Logistic regression indicated memory and orientation performance correctly classified 93% of patients. Voxel-based morphometry identified grey matter volume in the retrosplenial cortex to be critical for orientation dysfunction in AD.

Conclusions: These findings support the view that employing measures of spatial orientation in concert with episodic memory tasks in a clinical setting can discriminate between AD and FTD patients.

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The neural signature of recent and remote autobiographical memory – evidence from the dementias

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Background and aims: Retrieval of personally relevant events from the past via autobiographical memory (ABM) relies upon the integrity of a distributed network of regions in the brain. Compromised ABM recall is well established in neurodegenerative disorders; however, the neuroanatomical signature of these deficits remains unclear. This study aimed to establish the neural correlates of ABM disruption across recent and remote time periods in younger-onset dementia syndromes.

Method: Recent and remote ABM was assessed using the Autobiographical Interview in 11 behavioural-variant FTD (bvFTD), 10 semantic dementia (SD), 15 Alzheimer's disease (AD) patients, and compared to 14 healthy older Control participants. All participants completed a comprehensive battery of neuropsychological tests and a structural MRI.

Results: Consistent with previous studies, global ABM impairments were observed in bvFTD and AD, which correlated with verbal fluency performance in both groups. SD patients displayed relatively preserved recent memory, but striking alterations in remote memory. Notably, remote ABM deficits in SD correlated exclusively with semantic memory. Voxel-based morphometry analyses revealed distinct neural correlates for ABM retrieval in each patient group. Irrespective of time period, ABM retrieval was associated with integrity of left temporal, orbitofrontal, and frontopolar regions in bvFTD, and bilateral frontopolar, medial temporal, and occipital regions in AD. Remote memory deficits in SD related predominantly to atrophy in left temporal regions known to support semantic processing. **Conclusions:** Our results reveal prominent ABM dysfunction in younger-onset dementia syndromes, attributable to atrophy in dissociable regions of the brain. These findings underscore the importance of a distributed network of brain regions for remembering personally relevant events from the past.

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Rehabilitation of memory - insights from cognitive training in ageing and neurodegenerative disease

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Background and aims: Decline in memory function is common in ageing, but importantly it is also a major feature of many neuropsychiatric and neurodegenerative diseases affecting older people. Research suggests that behavioural interventions focusing on cognitive rehabilitation strategies (including cognitive training) have potential to improve memory and psychosocial functioning in these groups.

Method: This presentation will review the findings pertaining to memory rehabilitation in these groups, including our own work in older adults with Mild Cognitive Impairment, late-life depression and Parkinson's disease. It will incorporate findings pertaining to memory strategy training as well as computerized cognitive training and how these may relate to broader aspects of psychosocial and neuropsychiatric functioning (e.g. mood, sleep etc.) and neurobiological outcomes.

Results: Despite methodological heterogeneity across the literature, overall evidence supports the use of both memory strategy training and computerized cognitive training in older people, particularly in normal ageing and mild cognitive impairment. More recent findings indicate concurrent neurobiological changes, suggesting that such behavioral interventions have the potential to modify brain functioning. Importantly, no adverse effects have been reported.

Conclusions: Further studies are required to map the time-course of cognitive training to underlying neurobiological change, and to ascertain the most critical period for intervention. Ongoing research will also aid in clarifying clinically relevant factors such as predictors of individual responsiveness, generalisability to daily functioning, sustainability of effects over time, and longitudinal prevention of dementia or slowing of neurodegeneration.

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Concurrent Session 13 – Predictors of cognitive, academic and mental health outcomes in very preterm survivors

Handedness and cognitive outcomes in very preterm children

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Background and Objectives: Very preterm (VPT) children are reported to have higher rates of non-right handedness (NRH) compared with their term-born peers. Previous research has suggested that NRH is associated with cognitive and motor difficulties in this population; however findings are limited and conflicting. Given that the age of viability has decreased in recent decades, it is important to re-evaluate the association between NRH and cognitive outcomes in more contemporary VPT cohorts. The objective of this study was to evaluate whether poorer cognitive outcomes are associated with NRH in VPT children at age 7-years using a standardised measure of hand preference.

Method: 175 VPT (gestational age (GA) <30 weeks' and/or birthweight <1250 g) and 69 term (37 to 42 weeks' GA and ≥2500 g) children completed standardised measures of handedness, IQ, academic achievement, working memory, language, and motor skills at 7 years' corrected age. Logistic and linear regression models adjusted for social risk and corrected age at assessment, were applied to assess differences in the proportion of NRH, as well as main and interaction effects of NRH and birth group on cognitive outcomes at 7 years.

Results: Though not statistically significant, a higher NRH prevalence was observed in VPT children (30.9%) compared with term controls (21.7%) ($p = 0.13$). VPT birth was associated with poorer performance on all cognitive domains (all $p < 0.05$), while there was weak evidence to suggest that NRH was associated with poorer mathematical and working memory abilities ($p = 0.05$). For VPT children only, there was indication that NRH was associated with poorer reading and mathematical skills ($p < 0.05$).

Conclusion: NRH is associated with academic difficulties in VPT children, suggesting that VPT birth likely alters the relationship between handedness and cognition.

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Neonatal MRI is associated with future mathematical achievement in preterm children

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Background and objectives: Children born preterm are at risk for low mathematical achievement. Early identification of preterm children at risk for future impairments utilising brain markers might assist in referral for early intervention. One measure sensitive to brain development and pathology is Jacobian maps from deformation based morphometry (DBM), a method for identifying subtle macroscopic differences in brain shape and volume between different populations. This study examined the use of neonatal DBM to predict skills important for mathematical achievement (working memory, early mathematical skills) at 5 and 7 years in a cohort of preterm children.

Method: Participants were children born <30 weeks' gestational age (GA) at the Royal Women's Hospital in Melbourne, Australia and recruited into a prospective longitudinal cohort study. At term-equivalent age 224 infants underwent MRI. Working memory and early mathematics skills were assessed at 5 years (n=195) and 7 years (n=197). Each T2 image was aligned to a term-age template, registration to the template was performed to compute the deformation fields, and the Jacobian determinant matrices were used as predictors in general linear models.

Results: Localised regions around the insula and putamen in the neonatal Jacobian map were positively associated with early mathematics at 5 and 7 years (both $p < .05$), even after covarying for important perinatal clinical factors. The neonatal Jacobian map showed the same trend for association with working memory at 7 years (models ranging from $p = .07$ to $p = .05$).

Conclusion: We identified regions around the insula and putamen using neonatal DBM associated with skills important for childhood mathematical achievement. Results contribute to the growing evidence for the clinical utility of neonatal MRI for early identification of preterm infants at risk for childhood cognitive and academic impairment.

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Cerebellar-cortical connectivity contributes to working memory function in children born extremely preterm

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Background and aims: White matter and cerebellar injury are common in extremely preterm children (EP) (birth \leq 28 weeks gestation) and may explain their cognitive impairments. However, it is currently unknown whether disturbed cerebellar-cortical connectivity represents a neurobiological substrate of working memory deficits observed in this population. This study examined cerebellar-cortical white

matter tract maturation and its association with working memory in EP children at 7 years of age.

Method: A cohort of 60 EP children underwent neuropsychological assessment and diffusion-weighted MRI. Probabilistic tractography was used to examine the microstructural organisation of the cerebello-thalamo-prefrontal pathway (CTPP), in addition to the superior longitudinal fasciculus (SLF), well-recognised for its involvement in working memory. Verbal and visual short-term memory and working memory were evaluated using Working Memory Test Battery for Children (WMTBC) subtests.

Results: Increased diffusivity (i.e. increased radial, axial, and mean diffusivity) in the left CTPP was related to lower verbal working memory and visual short-term memory performance, while increased right CTPP diffusivity was associated with lower verbal working memory and verbal and visual short-term memory performance (all moderate to strong relationships with $p < .05$). Hemispheric asymmetry was noted in the SLF; higher left SLF axial diffusivity related to lower verbal working memory performance ($p = .01$), whereas right SLF diffusivity was unrelated to working memory. Relationships remained after controlling for corrected age, intracranial volume, and sex interaction effects.

Conclusion: Along with frontal-parietal connections such as the SLF, diffusion parameters in bilateral cerebellar-cortical connections should also be considered when identifying microstructural markers of the functional maturation of working memory in EP children.

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Family functioning and mental health in adolescents born <28 weeks/<1000g compared with controls

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Background and aims: Extremely preterm birth (EP; <28 weeks) and extremely low birth weight (ELBW; <1000g) are known to impact on parents and family units. Amongst preterm children, altered early attachment and family functioning has been identified in the early childhood years and linked with poorer child outcomes. However, long-term family functioning data is limited. We aimed (1) to compare teen-rated family functioning in a geographical cohort of EP/ELBW and normal birthweight (>2499g) control adolescents, and (2) to explore relationships between family functioning and concurrent anxiety and depression symptoms, and whether this varied by group.

Method: 148 EP/ELBW and 117 control adolescents (mean age 18.2y, SD 0.8) completed the Family Environment Scale, Beck Anxiety Inventory, and Center for Epidemiologic Studies Depression Scale Revised. Anxiety and mood symptoms were divided into "high" and "typical" ranges. Generalised estimating equations were used to compare family functioning between EP/ELBW and control groups,

and to predict anxiety and mood symptoms from family functioning.

Results: EP/ELBW adolescents reported less conflict, more organisation and more parental control in their families compared with controls, but other scales were similar. Across all participants, less cohesiveness and higher conflict were associated with high anxiety scores and high depression scores, accounting for age and gender. Lower family expressiveness was also associated with high anxiety scores. There was little evidence that relationships between family factors and mental health varied by birth group.

Conclusions: EP/ELBW adolescents reported less conflict and more structure in their families compared with controls. Aspects of family functioning were associated with concurrent anxiety and mood symptoms in both groups, and may suggest avenues for optimising mental health outcomes for EP/ELBW adolescents.

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Concurrent Session 14 – Memory

Remote Memory: Through the lens of lesion analytic and neurophysiological studies

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Background and aims: The neural underpinnings and psychological parameters of consolidation are explored by examining remote memory in patients with focal brain lesions and neurophysiological disruption due to epilepsy and electroconvulsive therapy.

Method: Theories of consolidation are reviewed and clinical investigations are presented to highlight neural systems critical for long term memory storage.

Results: Data from single case studies of patients with frontal and temporal lesions are reviewed to identify factors that affect the pattern of remote memory loss. Studies of patients with epilepsy and those undergoing treatment with ECT are presented to underscore the deleterious effects of physiological disruptions in the secure representation of long term memories.

Conclusions: Forgetting from remote memory is related to the nature (i.e., autobiographical versus semantic) of the to-be-remembered information and frequency of rehearsal. In addition location and extent of lesion affects retrieval from long term memory. Seizures in the context of epilepsy and ECT result in accelerated forgetting from long term and “gaps” in autobiographical memory.

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Different rates of accelerated forgetting for verbal and visuo-spatial material in temporal lobe epilepsy: implications for theories of memory acquisition and consolidation

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Background and Objectives: The hypothesis of ‘accelerated long-term forgetting’ in temporal lobe epilepsy (TLE) has often been attributed to disruption to ‘late’ memory consolidation. However, methodological challenges in the literature have led some to question whether this phenomenon could actually be attributable to a subtle acquisition deficit

and/or to ‘early’ rather than ‘late’ forgetting. This study aimed to address these questions and explore which pathophysiological variables are associated with forgetting.

Method: Eighteen participants with TLE and eighteen neurologically healthy age-, education-, and intelligence-matched controls, who had comparable standardised memory test performance, were recruited. They were presented with two novel verbal and visuo-spatial forgetting measures designed for the current study to meet a number of methodological criteria. Cued recall was tested 30 seconds, 10 minutes, one day, and one week after learning.

Results: Rates of forgetting differed between measures: participants with TLE exhibited progressively accelerated forgetting over one week post-learning for verbal material, and by 10 minutes post-learning for visuo-spatial material. Identical interactions were observed when only including ‘good’ learners in these analyses. Mesial temporal lobe pathology and use of multiple anti-epileptic drugs were associated with faster 10-minute forgetting rates for both measures. The only variable associated with accelerated long-term forgetting was right-hemisphere seizure lateralisation on the visuo-spatial task.

Conclusions: Our findings show that people with TLE exhibit accelerated forgetting for both verbal and visuo-spatial material, albeit at differing rates. Greater support was found for the influence of ‘early’ disrupted retention in our findings of accelerated forgetting, with less and only tentative support for the notion of disrupted ‘late’ consolidation. Accelerated forgetting is likely to occur on a continuum of severity, with different variables affecting how soon after learning accelerated forgetting is apparent.

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Memory for context and field dependence in patients with moderate-to-severe Traumatic Brain Injury (TBI)

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Background and Objectives: Context Effect (CE) is said to have occurred when stimuli from the study phase are identified more accurately in the test phase when presented with the original contextual information than when presented with a different context. Previous studies reported that while memory for contextual information in patients with TBI was impaired when measured directly (i.e., source memory) CE was preserved (i.e., indirect measure of context). The multifactorial model of CE demonstrated that the CE is not a uniform process but rather is composed of at least two distinct processes - binding and additive familiarity. The goals of this study were testing patients suffering from moderate to severe TBI with a paradigm that enables distinction between binding and additive familiarity components of CE and testing whether field dependence could predict the extent of CE.

Method: CE (Faces & Hats task) and field dependence (Embedded Figure test) tasks were administered to 20 controls and to 21 patients with moderate to severe TBI.

Results: Although the patients recognized fewer faces than controls did in total, CE was identical in the two groups. Furthermore, both the binding and additive familiarity components of CE were preserved. It was also found that the more a person showed field dependence, the stronger the CE. **Conclusions:** Although patients' memory for target information was weaker than that of controls, both groups benefited from the contextual cues to the same extent. Field dependence was shown to be a predictor of utilization of contextual information as retrieval cues.

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Validation of 27-item Comprehensive Assessment of Prospective Memory Test (Hong Kong Chinese version) for older adults with questionable dementia

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Background and aims: There is high prevalence of prospective memory (PM) problem in older adults with questionable dementia. This project aimed to validate a Hong Kong Chinese version which was developed from the original Comprehensive Prospective Memory Questionnaire (CAPM). **Method:** Subjects were recruited from Psychogeriatric Day Hospitals, Out-patient Units and Memory Clinics in Hong Kong. Patients of age 65 or above, both gender with diagnosis of questionable dementia as indicated by Chinese Clinical Dementia Rating Scale (score of 0.5) were recruited. The 27-item Hong Kong Cantonese version of CAPM is a self-report questionnaire developed earlier through translating and validating its content, linguistic and cultural relevancy through an expert panel.

Results: A total 67 subjects were successfully recruited and 28 of them also completed test-retest reliability study. Mean age was 78 (SD=8), with 50 males and 17 females. Cronbach's Alpha was 0.868, while item-total correlation was 0.869 and 0.870, after deletion of item 10 and 14 respectively. For test-retest reliability, there were no statistical difference between the test and re-test of BADL-, IADL- and Total score of 27-item CAPM. Internally, the BADL score of PM correlated high with IADL and Total score (Pearson correlation coefficient = 0.873 and 0.974 respectively; $p < 0.001$). The IADL correlated with total score at 0.675 with $p < 0.001$. By Rasch Analysis, the item reliability was 0.87. All items fitted in the Rasch Model well except item 3, 20, 12. Data collection is still on going. More conclusive findings will be obtained for studying its construct validity through factor analysis and comparison with healthy control through ROC curve study.

Conclusions: The 27-item CAPM can be a valid Chinese Assessment of Prospective Memory, with acceptable internal consistency and test-retest reliability, and evidence of validity in questionable dementia.

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"Be-smart" computer-assisted training for older adults with memory decline: a preliminary study

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Background and aim: A new "Be-smart" computer-assisted training programme using tablet PC has been developed for older adults living in the community. The study aimed to evaluate the effectiveness of this training programme for older adults with cognitive decline.

Method: Community dwelling older adults with cognitive decline were recruited and randomly allocated into either a "Be-smart" computer-assisted training program or a conventional training group. Outcome indicators included Montreal Cognitive Assessment – Hong Kong version (HK-MoCA), FULD Object Memory Evaluation, Comprehensive Assessment of Prospective Memory. They were conducted at pre- and post-training period.

Results: 62 subjects (12 male, 52 Female), age ranged from 62 to 92 (mean =76.4, SD=7.4) completed the study. Both Be-

Smart training group and conventional training group showed significant improvement ($p < 0.05$) in outcome variables. But Be-Smart training group showed better improvements than control group.

Conclusion: Be-Smart training programme can be an alternative treatment option for better outcome in improving memory performance for older adults with cognitive decline
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Concurrent Session 15 – Cognitive control deficits in addiction

Cognitive control and transition from nicotine use to dependence

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Background and aims: Two predictors of developing later drug addiction among drug-naïve children is their sensitivity to reward and cognitive control function. We have recently begun examining the neural mechanisms underlying the interaction between reward and control in drug-dependent and drug users prior to the transition to dependence.

Method: We have used functional MRI to explore behaviours hypothesised to contribute to the transition from drug use to dependence: (1) exerting control over reward-related impulses; and (2) adapt behaviour following negative feedback (punishment). This work includes dependent and non-dependent cigarette (nicotine) smokers.

Results: Our data indicate that dependent cigarette smokers have significantly greater difficulty inhibiting their response to a rewarding stimulus when compared to matched control participants. This difference is particularly apparent during experimental conditions that maintain reward-response associations when the participant fails to inhibit an overlearned response. Successful cognitive control over reward-related stimuli requires significantly greater activity in prefrontal (dorsolateral and inferior frontal) regions critical to cognitive control, in comparison to punishment related stimuli, or to matched controls participants.

Conclusions: The current data suggest that differences in sensitivity to reward and punishment in dependent drug users make inhibitory control to rewarding stimuli particularly difficult for drug dependent participants. Our preliminary data suggest that such differences are emerging prior to the transition to dependence, and our longitudinal follow-up will examine to what extent such individual differences predict those drug users who transition.

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Combined Effects of Marijuana and Nicotine on Memory Performance and Hippocampal Volume

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Objective: Combined use of marijuana (MJ) and tobacco is highly prevalent in today's smoking population. Individual use of either substance is linked to structural brain changes and altered cognitive function, especially with consistent reports of hippocampal volume deficits and poorer memory performance. However, the combined effects of MJ and tobacco on hippocampal structure and on learning and memory processes remain unknown.

Methods: In this study, we examined both the individual and combined effects of MJ and tobacco on hippocampal volumes and memory performance in four groups of adults: MJ-only users (n=36), nicotine-only (Nic-only, n=19), combined marijuana and nicotine users (MJ+Nic, n=19) and non-using

healthy controls (n=16). Total bilateral hippocampal volumes and memory performance (WMS-III logical memory) were compared across groups controlling for total brain size and recent alcohol use.

Results: Results found MJ and MJ+Nic groups had smaller total hippocampal volumes compared to Nic-only and controls (p 's<.05). In contrast, immediate and delayed story recall was only significantly lower in MJ+Nic users compared to controls and Nic-only (p 's<.05). While controls showed a trend for larger hippocampal volumes being linked to better memory scores, MJ+Nic users showed a unique inversion, whereby smaller hippocampal volume was associated with better memory.

Conclusions: Overall, results suggest abnormalities in the brain-behavior relationships underlying memory processes with combined use of MJ and tobacco. Given that MJ+Nic users showed opposite brain-behavior relationships compared to controls, further research will need to address potential opposing effects of MJ and nicotine.

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Repairing marijuana related brain harms

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Background and aims: While marijuana holds therapeutic potential, prolonged, heavy use of marijuana, especially its primary psychoactive constituent - delta-9-tetrahydrocannabinol (THC), is associated with adverse effects on the brain, especially the hippocampus. The extent to which these harms recover with abstinence is unknown. Furthermore, while cannabidiol (CBD), another key constituent of marijuana, has been suggested to protect against such harms, this has not been adequately examined in humans. **Method:** Here, I will discuss potential remedial approaches including the role of CBD, as well as positive lifestyle factors such as increased physical exercise and extended periods of abstinence from marijuana use.

Results: The preliminary findings suggest that these remedial approaches have beneficial effects on 'brain health'.

Conclusions: These relatively simple and accessible remedial options should be further researched so as to establish the 'optimal' level of each to achieve the most efficacious outcomes.

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Cognitive control and dorsolateral prefrontal function in stimulant dependence

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Background and aims: Substance use and gambling are now conjointly classified as addictive disorders based on overlap in terms of neurobiology and clinical manifestations. However, the direct comparison of cognitive and brain function between substance use and gambling disorders provides a model of drug-induced neurotoxicity, as substance use involves active detrimental effects in the brain, whereas gambling can only shape the brain through sensory and behavioral stimulation. This study aims to contrast cognitive and brain function in patients with cocaine dependence versus patients with pathological gambling.

Method: Participants diagnosed with cocaine dependence and participants diagnosed with pathological gambling -both lacking other significant comorbidities- were compared in terms of neuropsychological performance on executive function tests and functional magnetic resonance imaging (fMRI) during cognitive control tasks.

Results: Convergent evidence from neuropsychological and fMRI data indicates that cocaine dependence is specifically associated with impaired function of the dorsolateral prefrontal cortex compared to pathological gamblers.

Conclusion: Substance (i.e., stimulant) use disorders are specifically associated with deficits linked to dorsolateral prefrontal cortex function, which likely reflects cocaine-induced neurotoxic effects. This finding suggests that cognitive enhancement and brain stimulation interventions targeting dorsolateral prefrontal cortex function may improve clinical outcome in stimulant addiction.

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Concurrent Session 16 – Improving functional outcomes in multiple sclerosis

Understanding the complexities of unemployment in multiple sclerosis (MS)

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Background & Aims: Unemployment in multiple sclerosis (MS) is a pressing issue, with reports of 70% to 80% of individuals with MS becoming unemployed within five years following diagnosis. Factors found to be associated with unemployment consist of female gender, age, less education, greater disability, progressive course, fatigue and cognitive difficulties. However, these variables only account for 14% to 21% of the variance. More recently, greater attention has been given to the role of person-specific factors such as personality, self-efficacy, and coping and their role in unemployment and other functional limitations in MS.

Method: This presentation will provide a review of what we know about unemployment in MS and its known factors.

Results: We will then turn to more recent developments in the research, which suggest that greater attention be given to "less known," person-specific factors (e.g., personality, self-efficacy) when discussing employment issues and making informed decisions regarding such.

Conclusions: We will conclude with a discussion of possible avenues of intervention that may better assist individuals with MS staying employed.

Assessing Everyday Life Functional Activity in MS using Actual Reality

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Background and aims: While it is now well known that up to two-thirds of person with multiple sclerosis (MS) suffer from cognitive impairment, its effect on everyday life is less well understood. Clinicians and researchers typically rely on patient or proxy self-report or on small samples of behavior (e.g., kitchen tasks) to assess one's functional activity. However, such techniques suffer from a number of problems such as report bias, expense, and poor construct validity.

Method: This presentation will present several studies examining the relationship between cognitive dysfunction and emotional distress and actual everyday life functional activity through use of the internet (e.g., purchasing airline tickets, cookies, etc), called "Actual Reality."

Results: These studies show that cognitive impairment is significantly associated with poor actual functional disability, while patient and proxy self-report is associated with emotional distress.

Conclusions: Actual Reality is a promising technique to assess actual everyday functional activity in persons with MS.

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Depression and Functional Ability in Multiple Sclerosis (MS)

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Background and aims: Depression is extremely common in multiple sclerosis (MS), with lifetime prevalence rates approaching 50%. In some studies it has been shown to be associated with cognitive impairment, maladaptive coping, low levels of well-being, higher levels of disability, and employment. However, relatively little attention has been paid to how different aspects of depression in MS may relate to functional ability.

Method: This presentation will first provide a review of models of depression in MS, as well as methods that have been developed to assess it validly in MS. Then several studies from our lab will be presented that examine depression in relation to functional outcomes in MS, including employment, aspects of quality of life, and cognitive health habits.

Results: Our studies show that depression is inconsistently related to employment status, but is associated with indices of quality of life, as well as cognitive health.

Conclusions: Our research suggests that treatment of depression may lead to improved quality of life, as well as better cognitive health habits in MS; in turn, the latter may result in better cognitive functioning with aging in individuals with MS. Alternative possible causal scenarios will also be explored.

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Sensitivity of the Behavioural Assessment of Dysexecutive Syndrome (BADs) in multiple sclerosis and association with daily functioning

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Background and aims: The nature and impact of executive dysfunction for people with multiple sclerosis (PwMS) is not fully understood with traditional neuropsychological measures lacking sensitivity to detect milder cognitive problems and few ecologically valid tools available. This study explored the sensitivity of the Behavioural Assessment of the Dysexecutive Syndrome (BADs) for classifying executive dysfunction in PwMS and its ability to predict impact on daily functioning.

Methods: Performance on the BADs was compared between PwMS (n = 67) and healthy controls (n = 67) using independent t-tests. Correlational analysis was used to determine whether performance on the BADs was associated with functional impacts on Instrumental Activities of Daily Living (IADL) using the Frenchay Activities Index.

Results: 19.4% of PwMS were categorised as “impaired” on the BADs. There were significant differences between groups on overall BADs performance ($p < 0.001$) and for all subtests ($ps < .01$), except Temporal Judgment. Executive dysfunction was significantly associated with poorer everyday functioning

in outdoor ($r = .43$), leisure ($r = .46$), and domestic activities ($r = .26$).

Conclusions: Performance of PwMS was significantly poorer on tasks requiring cognitive flexibility, planning, problem solving, behaviour regulation, monitoring and organisation, but not self-awareness. BADs performance was associated with engagement in IADL, supporting the validity and usefulness of the BADs as an assessment tool for PwMS.

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Concurrent Session 17 – Improving outcomes after adult epilepsy surgery: From pre-surgical memory assessment to post-surgical memory rehabilitation

Setting the Stage: Evolution of views of variable memory outcomes following epilepsy surgery

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Background and Objectives: Understanding the risks and mechanisms of variable memory outcomes following anterior temporal lobectomy (ATL), including striking memory decline, evolved over decades. This presentation will overview the development in knowledge that led to our current understanding.

Method: Structured review of epilepsy surgery literature in relation to memory outcomes and predictors of pre- to post-operative memory change.

Results: The developments that contributed to the current understanding of the risk and predictors of significant memory decline following ATL included: 1) early characterisation of the general risk of verbal and visual memory change following left and right ATL, information provided by the earliest early surgery centers; 2) demonstration of the relationship between quantitative measurements of hippocampal pathology and pre-operative or interictal verbal and visual memory performance reflected in psychometric and Wada memory results; 3) extension of known pre-surgical relationships between hippocampal pathology and memory function to predict postoperative changes using qualitative and quantitative markers of hippocampal pathology; 4) theoretical reformulation of epilepsy surgery cognitive risk from one of adequate contralateral compensation to ipsilateral functional adequacy; and 5) characterization of the demographic, clinical epilepsy, and neuroimaging factors predictive of ipsilateral functional adequacy.

Conclusions: Six decades of neuropsychology research has led to an understanding of the variable memory outcomes that can be observed following ATL, the mechanisms underlying this variability, and pertinent risk factors. These and other issues will be discussed in the subsequent presentations.

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Functional imaging protocols for assessing surgical risk to memory

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Background and Objectives: Clarifying the aims of functional imaging in the assessment of surgical risk to memory, their alignment with the cognitive architecture of memory paradigms, the extent to which neurocognitive systems of interest are effectively targeted, and the extent to which postoperative memory outcomes are meaningfully assessed.

Method: Systematic review of memory fMRI literature with an emphasis on pre-surgical decision making and

postoperative memory outcome in the context of anterior temporal lobectomy (ATL).

Results: (1) The development of functional neuroimaging approaches to memory risk assessment have been intimately related to the rise of imaging technologies and decreasing confidence in invasive techniques. (2) Proneness of early generation scanners to susceptibility artefact in the inferior temporal region encouraged the use of complex paradigms that maximally recruited neocortical networks. (3) Progress was frustrated by difficulties in recruiting hippocampal activity, leading to re-conceptualisation of the functional neuroanatomy of memory and modes of hippocampal system activity. (4) Recent work has seen the emergence of meaningful mesial temporal recruitment, increased understanding of memory networks of interest, evaluation of the predictive significance of recruitment asymmetry metrics versus functional capacity ipsilateral to the focus, and incorporation of mechanisms of plasticity and re-organization.

Conclusions: Progress has been substantial, but functional neuroimaging of memory has been beset by complexities not encountered in fMRI lateralization of language. There is a paucity of outcome studies, and consensus predictive models have yet to be developed. Effective combination of structural with functional anatomical variables in predicting outcome is a promising direction.

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Applying the Evidence: Ensuring patient informed consent

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Background and Objectives: The decision to proceed with surgery is complex. Candidates need to weigh up their chances of being seizure free, or having a significant reduction in their seizures, against the inherent risks associated with the procedure and the risks of experiencing a significant post-operative memory decline. To give truly informed consent, this complex calculation then needs to be evaluated against the candidates' expectations of life following surgery.

Method: We examined the risk factors associated with significant memory decline and surgical outcomes of class two or below using the ILAE 2008 classification in a consecutive series of 576 patients who have undergone elective surgery for medically intractable epilepsy at the National Hospital, Queen Square over the past 20 years.

Results: Regression analyses suggest that older age, normal imaging and normal pre-operative function are all predictors of a surgical double whammy (incomplete seizure control and significant memory decline).

Conclusions: Informed consent requires the clinician to provide accurate information regarding the risk/benefit ratios of the procedure in the widest possible context. It also requires the candidate to be able to weigh up this information accurately. Whilst multivariate techniques provide increasingly accurate information for surgical candidates, relatively little attention has been paid to the ways in which they use this information in the surgical decision making process. Ways in which this latter shortcoming can be addressed will be discussed.

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Memory rehabilitation in epilepsy: Improving post-surgical outcomes

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Background and Objectives: Memory problems are very common in people with epilepsy (PWE). Providing education about memory and teaching cognitive strategies has proven beneficial for patients with acquired brain injuries. This presentation will consider the usefulness of this type of memory rehabilitation in PWE.

Method: Memory strategy training has been administered to individuals as well as in group settings to both adult and paediatric PWE. The training has ranged from teaching a single strategy (e.g., visualisation or diary use) to diversified instruction on lifestyle issues affecting memory as well as various mental strategies and memory aids. Pre-and post-training assessments usually include subjective measures such as reports of strategy use and everyday memory function, as well as objective, psychometric memory tasks.

Results: Significant improvements after training have been found most reliably on measures of strategy use, word list learning and subjective reports of everyday memory. Some studies have indicated that the improved performance is long lasting, with scores remaining higher than baseline more than three months post-training. Factors such as surgical resection, side of lesion and time since epilepsy onset do not seem to affect the amount of gain seen when pre- and post-training scores were compared. Individual baseline predictors of training gains include poorer memory, lower levels of depression, better attention and fewer anticonvulsant medications.

Conclusions: Training PWE to use memory strategies improves their level of functioning. The various ways this type of memory rehabilitation has been provided and its application to improving post-surgical memory outcomes will be discussed.

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Atypical language representation protects against verbal memory decline after left hemisphere epilepsy surgery in children

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Background and Aims: An important role of the preoperative neuropsychological evaluation in epilepsy surgery candidates is to evaluate the risk for postoperative cognitive decline. The most robust finding after surgical resection in the language dominant hemisphere is the emergence of anomia and verbal memory deficits; most commonly after left temporal lobe resection. Although atypical language dominance has been used as a mitigating risk factor for postoperative decline in language function following epilepsy surgery, its prognostic value with regard to memory outcome is less well established; especially in children. The current investigation was conducted to help determine whether atypical language dominance has a protective effect against verbal memory decline after left hemisphere resection in children undergoing epilepsy surgery.

Method: Forty-nine children from three comprehensive epilepsy surgery centers in the U.S. were classified into one of two language dominance groups (Left or Non-Left) based upon Wada language testing, and verbal memory functions were assessed before and after surgery with standardized neuropsychological memory tests.

Results: There was a significant pre- to post-surgery verbal memory decline among the Left language group and a relative pre- to post-surgery improvement in verbal memory in the children with atypical (Non-Left) language organization.

Verbal memory declined in 23/34 (68%) of Left language dominant children while 4/15 (27%) of atypical (Non-Left) language dominant children showed a verbal memory decline.

Conclusions: Children with atypical language representation appear to have a better prognosis for verbal memory outcome following epilepsy surgery in the left hemisphere than children with typical left language dominance.

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Professor Sarah Wilson

Concluding remarks

Concurrent Session 18 – Facilitating successful and safe return to driving following traumatic brain injury: assessment and rehabilitation

Characterising on-road driving performance following traumatic brain injury

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Background and Objectives: To maximise effectiveness of driving assessment protocols for people with Traumatic Brain Injury (TBI), it is important to understand how driving is compromised and who is at particular risk of experiencing difficulties. The objectives of this study were to (i) characterise the profile of specific on-road driving behaviours of people returning to driving following TBI and; (ii) examine demographic, injury, sensorimotor and psychological factors associated with driving performance.

Method: Thirty-nine participants with TBI (Age $M=40.43$ SD 13.98, 75% male, PTA days $M=33.41$ SD 29.03) and 49 healthy matched controls completed a standardised on-road driving assessment in addition to comprehensive motor, sensory, cognitive and psychological examination.

Results: Participants with TBI made significantly more errors during intersection ($t(41)=2.56$, $p < .05$), lane changing ($t(45)=2.03$, $p < .05$), and straight road ($t(46)=2.15$, $p < .05$) manoeuvres compared to healthy controls and committed significantly more observation ($t(40)=2.22$, $p < .05$), speed control ($t(40)=2.26$, $p < .05$), gap selection ($t(45)=2.32$, $p < .05$), lane position ($t(37)=2.55$, $p < .05$) and car control ($t(37)=2.41$, $p < .05$) errors. Reduced driving performance was significantly correlated with female gender, longer time post-injury, reduced visual perception and processing speed, reduced self-awareness and greater depression and anxiety symptoms (Spearman's r .23-.37, all $p < .05$).

Conclusions: Our sample of drivers with TBI exhibited a distinct profile of driving strengths and weaknesses during on-road assessment. These findings can be used to inform future driving assessment and rehabilitation programs. A range of demographic, cognitive and psychological factors were associated with driving following TBI; however, further research is required to understand the potential causal nature and predictive utility of these associations.

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Predictors of driving behaviour after TBI: Comparing cognitive tests, injury factors, and demographics.

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Background and objectives: Cognitive assessment is commonly used to judge readiness to resume driving after TBI, however, there is little evidence that performance on cognitive tests can predict driving behaviour in TBI patients. The aims of this study were to 1) examine the relationship between performance on a range of cognitive tests and the on-road driving assessment in a large TBI sample; and 2) to compare cognitive predictors of the on-road assessment with injury related and demographic predictors.

Method: Using a retrospective case series design, data were collected for 99 adults with mild-severe TBI regarding the outcome of their driving assessment (pass/fail) and performance on a range of cognitive tests commonly used by neuropsychologists.

Results: Correlations between some cognitive tests (Digit Span, Similarities, Block Design, RCFT delay, TMT B) and the on-road assessment were statistically significant but all were weak (r -values $< .3$). Regression analyses showed that cognitive tests were not significant predictors of the on-road driving assessment outcome. PTA duration as mediated by time post injury was a significant predictor such that participants with more severe brain injuries had later driving assessments and were more likely to fail.

Conclusions: Cognitive tests were not reliable predictors of the on-road driving assessment outcome. TBI severity may be a better predictor of the on-road driving assessment, however, further research is needed to understand the nature of its relationship to driving behaviour after TBI.

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DriveWise: Identification of and Support for Medically Impaired Drivers

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Background and aims: An interdisciplinary (Occupational Therapy, Social Work, Neuropsychology) driving assessment program will be discussed in relation to that factors that predict driving safety.

Method: 700 individuals with a variety of neurological conditions underwent office based and road testing in DriveWise. The DriveWise program will be described as will studies focused on predictive validity of factors associated with optimal road test performance.

Results: Regression analyses and analyses of variance were conducted in a number of different studies. Results demonstrated that cognitive screening tests such as the MoCA and MMSE predicted road performance in individuals with pre-ordained diagnoses of dementia but not in the "worried well." Specific neuropsychological measures (e.g., Trail Making Test) and demographic factors (e.g., family concerns, history of crashes) discriminated between safe and unsafe drivers.

Conclusions: Data from DriveWise participants reveal that tests of visual attention, processing speed and multi-tasking predict pass/fail status on road tests. Specific demographic variables and cut scores were identified on mental status tests to assist health providers in the identification of the at risk

driver. A cohort of very old drivers (90+ years) were studied in relation to driving competence.

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Self-awareness and self-regulation of on-road driving following Traumatic Brain Injury

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Objective: To examine self-awareness of on-road driving in individuals with traumatic brain injury (TBI) and to explore the associations with demographic, injury, cognitive and psychological variables. A second aim was to explore self-reported driving habits and the factors associated with these within the first three months of returning to driving

Method: Participants included 39 individuals with moderate to severe TBI (PTA duration $M=31.06$, $SD=29.14$ days) and 45 healthy age, education, and gender matched controls who completed an on-road assessment and the Brain Injury Driving Self-Awareness Measure (BIDSAM). Driving frequency, avoidance and behaviour questionnaires were completed prior to, and following, a three month observation period.

Results: Awareness scores on the BIDSAM were significantly worse in participants with TBI who failed the on-road assessment than those who passed and controls, $F(2, 83)=28.44$, $p<.001$, $\eta^2=.41$. Poor self-awareness was significantly correlated with reduced psychomotor speed, $r_s=-.37$, $p<.01$, and complex attention, $r_s=.28$, $p<.01$. Individuals with TBI expected greater reductions in driving frequency, $t(28.34)=-3.87$, $p<.01$, and increases in avoidance, $U=331.50$, $z=-2.64$, $p<.01$. On follow up significant reductions in frequency, $t(30.74)=-3.00$, $p<.01$, but not avoidance, $U=384.00$, $z=-1.73$, $p=.08$, were observed. Females were more likely to reduce their driving frequency, $r_s=-.44$, $p<.05$, while increased avoidance was associated with anxiety $r=.64$, $p<.01$, and neuroticism $r=.59$, $p<.01$.

Conclusions: Individuals with TBI who failed an on-road assessment significantly overestimated their driving ability. Individuals who made a return to driving expected their driving habits to change and their predictions were partially consistent with follow-up reports. These findings suggest impaired awareness of driving and psychological factors may need to be addressed as part of driver rehabilitation programs.

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Driver rehabilitation following traumatic brain injury

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Background and objectives: Many individuals with traumatic brain injury (TBI) return to driving after passing an on-road driving assessment, however little is known about the outcomes of those who fail the assessment and receive driver rehabilitation. The aim of this study was to investigate the outcomes, types of interventions and goals of driver rehabilitation in a group of patients with TBI who required more than one on-road assessment and /or driving lessons

Method: A retrospective design, was used to collect data on the goals and number of driving lessons and reassessments, time from injury until independent driving, prevalence of restricted licences and injury severity (PTA durations and GCS scores) from the OT driver assessment records of 340 participants who completed a driving assessment between 2002 and 2014.

Results: From the total sample, 95 drivers received driver rehabilitation, 17 required a second on-road assessment and 2 drivers required 3 on-road assessments. Licence suspension was recommended in only 8 cases. Goals of lessons included to: improve confidence; $n=52$ (54.7%) remediate poor driving habits/skills; $n=55$ (57.8%), develop compensatory strategies for cognitive impairment; $n=62$ (55.2%), for physical impairment; $n=25$ (26.3%) and visual impairment; $n=18$ (18.9%)

Conclusions: Failing an initial on-road assessment is not a good predictor of driving ability. For patients where pass/fail criteria are difficult to apply (borderline) a second on-road assessment should be considered and driver retraining should be offered for those who fail the initial on-road assessment. The decision to cease driving should be delayed until driver rehabilitation has been provided followed by reassessment.

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Jennie Ponsford

Discussant

Concurrent Session 19 – Community living after Brain Injury

“I’m considered unable to make decisions...not capable”: The subjective experience of decision making after severe TBI

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Background: Making decisions in one’s life is viewed as a human right and perceived as a sign of autonomy. Although individuals who sustain a severe TBI require support to make decisions in their lives, little is known about their experience of this process and its relationship to development of a self-narrative after injury. The aim of this study was to build an understanding of the subjective experience of adults with severe TBI in making decisions about life after injury.

Method: The researchers adopted a constructivist grounded theory approach informed by a symbolic interactionist perspective. Data included 20 individual in-depth interviews with 8 participants who had sustained severe TBI. Through a process of constant comparison, open and focussed coding of the data was undertaken until clear categories and sub-categories emerged.

Results: A model representing two major themes emerged from analysis. The first theme captured the centrality of decision making in the lives of participants. The second reflected the role of decision making in relation to self-conceptualisation after injury. Together, these themes

described how making decisions occurs in the context of setting and acting on individual goals and priorities after TBI. The process of decision making was therefore closely linked with a process of reconstructing self after injury.

Conclusions: This study provides in-depth qualitative evidence of the complex interaction between the experience of decision-making participation and self-conceptualisation after injury. Findings emphasise how an individual's experience of their interactions with others contribute significantly to feelings of power and control in their own lives. Strategies to support individuals to exercise choice and develop a positive self-concept are also highlighted.

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Improving communication-specific coping after traumatic brain injury: Evaluation of a new treatment using single case experimental design with replication

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Background and aims: The majority of people with moderate to severe TBI report difficulties with communication that can persist for several years impacting negatively on social outcome. As a result of these difficulties, people with TBI frequently experience communication breakdown and associated stress. Typically, communication-specific coping strategies are used in response to communication breakdown. Productive strategies enhance message transfer; non-productive strategies do little to resolve problems and frequently result in negative social interaction. This research aimed to evaluate the effectiveness of a new treatment, Communication-specific Coping Intervention (CommCope-I), which targets coping in the context of communication breakdown.

Method: Single case experimental design (A-B-A with follow-up using multiple probes) replicated with a second participant was used. Participants were Samantha, a 30-year old woman who had sustained severe TBI 8 years previously and Thomas, a 34-year old man who had sustained severe TBI when he was 29 years old. CommCope-I is a 6-week (12-hour) structured program. It targets personally-relevant productive coping strategies identified collaboratively with the client. Productive coping scripts are developed and practiced through a series of graded scenarios that are evaluated with the aid of video recording.

Results: Percentage of non-overlapping corrected data (PNCD) was used to analyse the data. PNCD involves a data-correction procedure to remove baseline trend from the data series prior to calculating the change produced as a result of intervention. A large treatment effect was demonstrated in both participants (PNCD: end of treatment Samantha = 100%, Thomas = 100%, 3-month follow-up Samantha = 100%, Thomas = 100%). These results are consistent with highly effective treatment.

Conclusions: This novel intervention elicited positive change in primary and secondary outcome measures providing clear support for further evaluation using randomised controlled trial designs.

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Which interventions are effective in improving meaningful occupation after traumatic brain injury? A systematic review and recommendations for clinical practice

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Background and aims: When return to work is not possible as a result of traumatic brain injury (TBI), alternative ways of meaningfully occupying time (including leisure and social activity) are crucial. This systematic review aimed to collate the evidence for the efficacy of community-based interventions for leisure/social activity after TBI and to identify features that could serve as practice recommendations.

Method: Three databases (Medline, PsycINFO and PsycBITE) were systematically searched to October 2014. Selection criteria included the following: primary studies on adults with TBI; intervention examining community-based programme/s targeting leisure/social activity; a full-length article in a peer-reviewed journal which contained quantitative data. Both group and single-case methodologies were included. Two raters independently screened the abstracts and extracted the data. Scientific quality of the studies was evaluated with standardised scales.

Results: Searches yielded 196 abstracts, with nine articles meeting selection criteria. Scientific quality of the studies was variable, ranging from poor to moderate. Only four studies used a controlled condition. Significant treatment effects were found in two controlled studies for improved mood and quality of life using active leisure programmes. Clinical practice recommendations identified include interventions that are planned, structured, goal-driven, intensive, and conducted over a period of months.

Conclusions: There is some evidence that active leisure programs improve mood and quality of life in people who have had TBI. Further research with robust methodology is required to evaluate the wider range of leisure/social activity programmes described in the literature.

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Embedding slow stream rehabilitation within a transitional housing and support model for people severe cognitive behavioural impairment

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Background and aims: Continuing the rehabilitation and support of people with severe cognitive behavioural impairments (including amnesic disorders, absconding, and aggression), especially when coupled with mental health issues, poses challenges in community settings. This complexity often results in increased levels of 1:1 support, restrictive practices, accommodation breakdown or placement in secure settings. The aim of this paper is to 1) describe an innovative transitional living model aimed at addressing the accommodation and rehabilitation gap for people with complex needs following brain injury – Victoria Community Living's Sir William Street (SWS) – and 2) present data on client outcomes in the first two years of the service.

Method: *Design:* Case series. *Participants:* Adults with severe acquired brain injury (n=17) in receipt of services from SWS (2012-2014). Of this group, longitudinal data for three clients who have received services for a minimum of two years will be presented; *Intervention:* Sir William Street Model is based on the *Community Approach to Participation* with the service staffed by trained Allied Health Assistants, with individuals' daily routines and supports structured by an occupational therapist and neuropsychologist; *Instrumentation:* Demographic survey, *Care and Needs Scale*, *Overt Behaviour Scale*, *Functional Independence Measure*,

Health of a Nation Outcomes Scale-ABI; Role Checklist, Community Integration Questionnaire. Data was collected pre-move and at 12 month intervals for two years.

Results: An overview of the physical and support environment at Sir William Street will be provided, with staff recruitment and training detailed. Challenges identified within the model will also be discussed. Examples of embedded behavioural strategies, daily routines and development of vocational opportunities will be presented. Outcome data demonstrated an increase in number of life roles and level of independence in basic daily activities and a reduction in challenging behaviours at each time point.

Conclusions: This model offers a community-based approach to contextualized slow stream rehabilitation embedded in supported housing for people with severe cognitive-behavioural impairments. The approach provides evidence for management of this complex group, offering a pathway to community living, and has capacity to be embedded in more traditional supported living settings.

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Using technology in supported accommodation to improve outcomes following acquired brain disorders

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Background and aims: One long-term community living option for people with acquired brain disorders (ABD) is shared supported accommodation (SSA). To date, there has been little research on use of *mainstream and assistive technologies* (M&AT) in SSA. This study aimed to 1) audit current M&AT used by people with disability living in Victorian SSAs; 2) identify perceived benefits or challenges of technology used; and 3) examine whether M&AT impacted resident autonomy, participation or support need.

Method: A customised survey (recording the amount and type of M&AT used by each SSA resident; the identified purpose of technology application; and impact of use on residents' day-to-day lives), the *Care and Needs Scale* and the Electronic Social Networking subscale of the *Community Integration Questionnaire-Revised* were administered with SSA house managers.

Results: To date, data has been collected on M&AT use of 236 residents via 29 managers working across 48 Victorian SSAs. Fifty-five per cent of residents experienced ABD, and 45% were technology users. Tablets (39%), smart phones (31%) and desktop computers (29%) were most commonly used. Perceived benefits of M&AT included maintenance of social contact, enhanced sense of safety during community access, and options for recreation. Challenges with 'soft' technology support (including training and expansion of use as resident skills developed) and associated costs were highlighted.

Conclusions: M&AT can positively impact the lives of people with disability, however are not used extensively by SSA residents in Victoria. Residents and their supporters require graded training to adopt or expand technology use and trouble-shoot issues to gain maximum benefit.

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Assisting young people in residential aged care to access the National Disability Insurance Scheme

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Background and aims: There are 6,200 Australians <65 years living in residential aged care. A majority will be eligible for a National Disability Insurance Scheme (NDIS) once it is launched nationally in Australia in 2018-2019. In 2014, the Summer Foundation commenced an NDIS Connections Project, finding and assisting young people in residential aged care (YPIRAC) in NDIS trial sites to access the Scheme. Using action research, this study aimed to: 1) examine characteristics of these YPIRAC; 2) document their NDIS access and planning requirements; and 3) identify enablers and barriers to Scheme uptake.

Method:

Participants: Adults <65 years in RAC in Victorian and NSW NDIS trial sites (n=50), 42% male, age M(R)=53(28-64) years. Main disability included acquired brain injury (54.9%), degenerative neurological conditions including multiple sclerosis and Huntington's Disease (14.6%), mental health issue (11.2%), intellectual disability (5.8%) and spinal injury (4.2%), with disability unknown for 6.9%. Intervention: 1:1 support from a Connections Officer until NDIS registration and plans were implemented. Measures: Customised survey including service utilisation and NDIS access needs questions; Care and Needs Scale (CANS).

Results: Fifty-six percent were not registered for disability services prior to the Connections Project. A majority (80%) experienced very high daily support needs (\geq CANS Level 6) and 20% did not have an advocate/guardian to assist with service access. After the first nine months of intervention, 52% were in receipt of NDIS funding, with 48% awaiting NDIS plan implementation.

Conclusions: This research provides further evidence of the marginalization of YPIRAC. Collaborative work with advocacy groups and the National Disability Insurance Agency is required to build capacity of YPIRAC, and support their access to the NDIS.

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Concurrent Session 20 – Cognitive and emotional disturbance in psychiatric disorders and HIV

Cognitive function and lifetime features of depression and bipolar disorder in a large population sample: cross-sectional study of 143,828 UK Biobank participants

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Background and aims: The purpose of this study was to investigate differences in cognitive performance between middle-aged adults with and without a lifetime history of mood disorder features, adjusting for a range of potential confounders.

Method: Cross-sectional study, using baseline data from the UK Biobank population cohort. Adults aged 40-69 (n=143,828) were assessed using brief measures of reasoning, reaction time, digit span and memory. Self-reported data on lifetime features of major depression and bipolar disorder were used to construct groups for comparison against controls. Regression models were used to examine the association

between mood disorder classification and cognitive performance, adjusting for sociodemographic, lifestyle and clinical confounders.

Results: Associations between lifetime history of bipolar or severe recurrent depression features and poorer cognitive performance were attenuated or reversed after adjusting for confounders, including psychotropic medication use and current depressive symptoms. Participants with a lifetime history of single episode or moderate recurrent depression features outperformed controls to a small but statistically significant degree, independent of adjustment for confounders. There was a significant interaction between use of psychotropic medication and lifetime mood disorder features, with reduced cognitive performance observed in participants taking psychotropic medication.

Conclusions: In this population sample of adults in middle age, lifetime features of recurrent depression or bipolar disorder were only associated with cognitive impairment within unadjusted analyses. These findings underscore the importance of adjusting for potential confounders when investigating mood disorder-related cognitive function.

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Fear circuitry function in anxious youths, youths at familial risk for anxiety disorders and healthy youths: an fMRI study

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Background and aims: The fear circuit, which includes the amygdala and prefrontal cortex, has been linked with anxiety and risk for the disorder. Very few studies examined these links in youths. The aim of this study was to examine fear circuitry function related to anxiety and risk for the disorder in youths using a new ethically acceptable fMRI fear conditioning task.

Method: 80 youths (10-17 years old) were recruited: 23 youths with current anxiety disorder (anxious group); 25 offspring without past or current anxiety disorder, but at high risk for anxiety because of their parents' past or current anxiety disorders (at-risk group); and 32 psychiatrically healthy offspring of psychiatrically healthy parents (control group).

Results: While viewing threatening cues (CS+) vs. safe cues (CS-): (a) control and anxious groups showed greater left amygdala activation ($ps < .01$; xyz: -16,0,-24); (b) control and at-risk groups showed greater left anterior cingulate cortex activation ($ps < .001$; ACC: BA24, xyz: -4,-10,28) compared to anxious youths, and (c) controls showed greater right dorsolateral prefrontal cortex activation ($ps < .001$; DLPFC: BA46, xyz: 58,30,18) compared to at-risk and anxious groups. Deactivation of amygdala and DLPFC in at-risk and of ACC in anxious groups were explained by greater responses to CS- vs. CS+ ($ps < .05$).

Conclusions: As expected, all groups showed fear conditioning as shown by amygdala responses, even as at-risk group showed fear generalization to CS-. However, only anxious youths showed emotional regulation difficulties in as they failed to recruit the ACC. Surprisingly, at risk and anxious groups failed to recruit the DLPFC. According to adult literature, their ability to differentiate threat from safety cues and to pay attention to relevant information may be

impaired. These data suggest that ACC activation may be reflecting a compensatory mechanism to prevent anxiety.

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Spectroscopic markers of memory impairment, symptom severity and age of onset in older people with lifetime depression: Role of N-acetyl aspartate and glutamate

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Background and aims: Glutamate (Glu) and N-acetyl aspartate (NAA) are markers of excitatory processes and neuronal compromise respectively. Increased Glu and decreased NAA concentrations have been implicated in the pathophysiology of depression and cognitive impairment respectively. We aimed to determine the relationship between NAA, Glu, memory and key clinical features in older people with lifetime depression compared to comparison subjects.

Method: Thirty-five health-seeking older adults (mean age = 63.57 years), with a lifetime depression diagnosis, and 21 age-matched healthy comparison subjects (mean age = 65.48 years) underwent neuropsychological testing, psychiatric assessment and proton magnetic resonance spectroscopy from which Glu and NAA were measured (reported as a ratio to creatine).

Results: Compared to comparison subjects, the depressed subjects showed poorer verbal learning and memory retention. Hippocampal NAA and Glu did not differ significantly between groups. However, in comparison subjects, lower levels of hippocampal Glu were associated with poorer memory retention ($r = 0.55, p = 0.018$). In the depressed subjects, lower levels of hippocampal NAA were related to poorer verbal learning ($r = 0.44, p = 0.008$) and memory retention ($r = 0.41, p = 0.018$). Greater hippocampal Glu was associated with more severe depressive symptoms ($r = 0.35, p = 0.039$) and an earlier age of illness onset ($r = -0.37, p = 0.031$).

Conclusion: Our findings highlight that hippocampal neurometabolites are entwined with both clinical and cognitive features and further suggest differential mechanisms may underpin these features.

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Asymptomatic Neurocognitive Impairment (ANI) is associated with progression to symptomatic HIV-associated Neurocognitive Disorders (HAND) in people with HIV: Results from the Ontario HIV Treatment Network (OHTN) Cohort Study

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Background and aims: A recent study from the US CHARTER Cohort has shown that ANI is associated with a 2- to 6-fold increased risk for the development of symptomatic HAND, i.e., mild neurocognitive impairment (MND) or HIV-associated dementia (HAD). The objective of this study is to replicate and extend these results in a Canadian sample.

Methods: Study sample included 679 adults (81% men, 62% Caucasian, 83% on cART, 72% with undetectable HIV viral load) who were either normal on neuropsychological (NP) testing (NP-Normal; n=357) or had ANI (n=322) at baseline. Annual NP testing was done with brief NP battery that included measures of processing speed, attention/working memory, and learning/memory. Cognitive complaints were assessed with four-item Medical Outcomes Study Cognitive Functioning scale. HAND status was assigned according to established Antinori et al., (2007) criteria and Cox proportional hazards regression model was used to estimate risk ratios for progression to symptomatic HAND.

Results: Over the follow-up period (median: 34 months), 150 individuals (59 NP-Normal and 91 with ANI at baseline) showed progression to symptomatic HAND. Participants with ANI had shorter time of progression than those who were NP-Normal at baseline, after adjusting for baseline and time-varying covariates: adjusted hazards ratio of 1.74 (95% confidence interval: 1.23-2.45; p<0.001). Among covariates examined, depression, current cigarette smoking, and non-Caucasian ethnicity were significantly associated (p<0.05) with higher risk of progression; whereas undetectable plasma HIV viral load was marginally associated (p=0.058) with lower risk of progression to symptomatic HAND.

Conclusions: Asymptomatic Neurocognitive Impairment is associated with almost a two-fold increased risk of progression to symptomatic HAND. Early treatment with cART and addressing medical and mental health comorbidities may delay or lower the risk for the development and progression of symptomatic HAND.

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Chronicity and recurrence of depression are key factors in whether depression affects neuropsychological performance in HIV-infected persons

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Background and aims: Research assessing whether major depressive disorders (MDD) impacts neurocognitive functions in HIV+ persons has yielded inconsistent results. However, none have considered the role of MDD remission, chronicity, and stability on treatment which are key factors of MDD severity and course. Our aim was to assess those factors to better characterize impact on neuropsychological functions.

Method: Ninety-five HIV+ adults clinically stable on combined antiretroviral treatment completed a psychiatric interview, a depression scale, a neuropsychological, daily living and cognitive complaints assessments at baseline and 18 months. MDD treatments were recorded. Participants were grouped into two psychiatric nomenclatures: 1. Lifetime: No MD episode (MDE), Single MDE life-event treated and fully remitted, Chronic MDD treated and stable, Chronic MDD

treated and unstable, and baseline untreated MDE; 2. Recent: Last 2 years MDE (yes or no).

Results: 41.2% of participants met criteria for a lifetime MDD: 15% had had one event successfully treated and fully remitted, 12.5% had chronic MDD which was clinically stable on treatment, 9.5% had chronic MDD treated but with clinical/treatment instability, and 4.2% presented with untreated MDE at baseline. In the last 2 years and including baseline MDE, 19% had a diagnosis of MDD. Lifetime and recent psychiatric history were more strongly associated with decreased independence in daily living (p<.0001), and cognitive complaints (p<.0001) than with baseline neuropsychological performance (p=.07). However, lack of full remission, instability on treatment in chronic MDD, and severity of symptoms in current MDE were factors in whether MDD impacted baseline neuropsychological performance (explaining 27% of variance in multivariate model adjusted for demographics). Depressive symptoms improved at follow-up in those with baseline moderate-severe symptoms, and MDD was not associated with neurocognitive change at 18-month (>.50).

Conclusions: MDD recurrence and chronicity profiles are key factors to understand potential impact on neurocognitive abilities in HIV infection. More comprehensive guidelines on how to interpret MDD effect on neurocognitive abilities in HIV infection are needed and this should serve to updating the HAND diagnostic criteria. Results need to be corroborated in a more demographically and ethnically diverse cohort for improved international representation of persons with HIV infection.

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Validity of four neurocognitive screening tests for HIV-associated Neurocognitive Disorders (HAND):

Preliminary results of sensitivity, specificity, and classification accuracy

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Background and aims: Several review studies, including our own, have shown that most cognitive screening instruments are useful for more severe forms of HIV-associated neurocognitive disorders (HAND) but less so for the milder forms, although there are numerous methodological issues that need to be addressed. The aim of this study is to assess these issues and the relative and concurrent validity of four screening tests for HAND against the gold standard for HAND diagnosis.

Methods: 104 adults (mean age: 51 years; 86% men) completed four screening tests: Cogstate Brief Battery (Cogstate), HIV Dementia Scale (HDS), Computer Assessment of Memory and Cognitive Impairment (CAMCI), Montreal Cognitive Assessment (MoCA), and comprehensive neuropsychological battery assessing processing speed, attention/working memory, learning/memory, and executive functions. HAND clinical diagnosis was made by a

Neuropsychologist. Results from screening tests were compared with clinical HAND diagnosis using Receiving Operator Characteristics (ROC) analysis.

Results: HAND was diagnosed in 60 participants (58%). Compared to clinical diagnosis, sensitivity [95% CI] estimates of screening tests were: adjusted HDS, 90% [80%-96%]; MoCA, 68% [55%-80%]; Cogstate, 67% [53%-78%]; and CAMCI, 27% [16%-40%]. Specificity estimates were: CAMCI, 100% [92%-100%], MoCA, 86% [73%-95%]; Cogstate, 80% [65%-90%]; and HDS, 36% [22%-52%]. AUC estimates indicated the MoCA test had the best accuracy

(AUC=0.774), followed by Cogstate (AUC=0.731), CAMCI (AUC=0.633), and adjusted HDS (AUC=0.632). Combination of any two screening tests (test positive by either one or both tests) resulted in classification accuracy improvements (AUC ranges: 0.623-0.815).

Conclusions: Our preliminary results suggest that the MoCA and Cogstate screening tests have moderate classification accuracy for HAND in people living with HIV. Further work is underway to determine the clinical utility and generalizability of these findings.

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FRIDAY POSTER SESSION

#	Presenter	Title
Poster Symposium 4		New approaches to understanding problems in social behaviour in severe traumatic brain injury (TBI)
1	Rosenberg, Hannah	Interested, annoyed or suspicious? A new test of complex emotions for adults with Traumatic Brain Injury (TBI)
2	Honan, Cynthia	Social disinhibition: Piloting a new clinical measure in traumatic brain injury (TBI) individuals
3	Francis, Heather	A modified version of the Social Skills Performance Schedule for evaluating social skills in traumatic brain injury.
4	McDonald, Skye	Willing or not? Problems understanding sincerity after severe Traumatic Brain Injury
5	Osborne-Crowley, Katherine	Developing an Observational Measure of Social Disinhibition after Traumatic Brain Injury
Poster Symposium 5		Novel approaches to investigate the psychophysiology of emotion processing
6	Sufani, Christopher	The Explicit and Implicit Audition of Emotions: An ERP Investigation of Vocal Emotion Perception Deficit Following Severe Traumatic Brain Injury.
7	Osborne-Crowley, Katie	Impaired reversal learning and attenuated feedback-related negativity amplitude in traumatic brain injury patients compared with controls
8	Trimmer, Emily	Enduring effects of Ostracism in Autism Spectrum Disorder: A physiological approach
Posters		
9	Adlam, Anna (Lucy Wigg)	Exploring the impact of traumatic brain injury on moral reasoning and how this relates to executive functioning, empathy and emotion-based decision making
10	Adlam, Anna (Ruth Payne)	Investigation into the frontal lobe functioning of young offenders with and without a head injury
11	Adlam, Anna (Briony Westgate)	Validating a parent-rated working memory questionnaire for children
12	Adlam, Anna (Tom Steverson)	Ecological Assessment of the Supervisory Attentional System in People with Intellectual Disabilities
13	Badge, Helen	Why should we bother to collect routine outcome data? How can we use it to enhance our understanding of client needs and improve outcomes in the NSW Brain Injury Rehabilitation Programme.
14	Bakker, Kathleen	Treating child behavior problems: parent and child outcomes following a group parenting intervention in a clinical pediatric rehabilitation setting
15	Barnes, Jessica	Can EBIQ identify change in ability to make friends?
16	Bartfai, Aniko	Selection bias in RCT trials in cognitive rehabilitation after acquired brain injury (ABI)
17	Beadle, Elizabeth	Changes to emotional and behavioural self-concept after TBI: Associations with threat appraisals and emotional distress
18	Behn, Nicholas	Improving the fidelity of behavioural treatments for people with brain injury: Describing the process for project-based treatment
19	Behn, Nicholas	Making use of goal attainment scaling (GAS) to improve communication skills following project-based treatment for people with acquired brain injury (ABI)

20	Bellon, Michelle	Families4Families Inc: Evaluating outcomes of participation in a South Australian peer support network for families following acquired brain injury
21	Bogdanova, Yelena	Neuromodulation treatment of sleep disturbance in veterans with blast TBI and PTSD
22	Bransby, Jason	Treating impaired self-awareness in adults with traumatic brain injury (TBI): A literature review and case study implementation
23	Brassel, Sophie	Conversation topics following severe traumatic brain injury: a study at three and six months post-injury
24	Brunner, Melissa	Tweets and Friends: Using Social Media after Traumatic Brain Injury
25	Bryce, Shayden	Examining the validity of the AUDIT and DAST in screening for substance use disorders following TBI
26	Callaway, Libby	"A place of my own": Experiences and outcomes of adults with acquired neurological disabilities living in a new supported housing model
27	Callaway, Libby	Determining the cost of living in the community after catastrophic brain injury in Victoria, Australia.
28	Elbourn, Elise	Revisiting the relationship between aphasia and cognition following severe TBI
29	Frith, Matthew	Speech pathology approach to the assessment of cognitive communication skills after TBI: Do we all do it the same way?
30	Gardner, Andrew	A video analysis of the use of the 'concussion interchange rule' during the first year of implementation in the National Rugby League
31	Glover, Nicola	Positive risk taking - Transition from a risk adverse rehabilitation setting to the risk filled community.
32	Gracey, Jacinta	Use of Cognitive Screening Tests by Allied Health Therapists in ABI Rehabilitation
33	Grant, Samantha & Carr, Belinda	A case presentation – Collaborative knowledge usage enabling successful community access in an individual with severe challenging behaviour.
34	Grima, Natalie	Attenuated melatonin production and sleep dysfunction following traumatic brain injury
35	Hall, Sarah	Predicting functional outcomes after acquired brain injury: The role of emotional intelligence
36	Hammersley, Eleanor	The impact of mild traumatic brain injury in predicting recovery following trauma in older adults: Acute outcome.
37	Hennessy, Maria	Do positive emotions influence recovery after chronic subdural haematoma?
38	Hoey, Bridget	Comparison of the Production of Formulaic Language by Adults with Traumatic Brain Injury (TBI) and Healthy Controls
39	Honan, Cynthia	The Awareness of Social Inference Test (TASIT) – A shortened version
40	Honan, Cynthia	Validating the computerised Austin Maze task in a Traumatic Brian Injury sample
41	Ito, Emi	Factors of self-awareness related to full time employment for the clients with cognitive dysfunctions
42	Jonker, Frank	Affective Theory of Mind and impaired Self Awareness in acquired prefrontal cortex injury
43	Kaucki, Adam	Visual and ocular processing deficits following traumatic brain injury: A systematic review
44	Kelly, Michelle	Are social skills impairments on the radar? Assessment practices of clinicians working in brain injury
45	Kooymans, Brooke	Defining 'Psychosocial in Brain Injury' – A critical appraisal of professional approaches
46	Liang, Phyllis	Mapping lifespace as a tool to enhance narratives: Understanding the needs, outcomes and experiences of family members during driving disruption following a brain injury.
47	Low, Essie	Beyond just neglect: Preliminary evidence of retrospective time estimation abnormalities in non-neglect stroke and TIA patients
48	Lukersmith, Sue	The development and implementation of a preliminary taxonomy on case management in brain injury (BICM-PT)
49	Mathias, Jane	Neurotoxic or neuroprotective? A meta-analysis examining the paradoxical effects of positive blood alcohol levels on outcomes after TBI

50	Mckay, Adam	Agitation during post traumatic amnesia and its association with disorientation and impairments in memory
51	Metcalfe, Kasey	Measuring reliable change in traumatic brain injury (TBI): The pitfalls of using readily available formulae
52	Morarty, Jacqui	Reflecting on the Manager's Commitment to Evidence-Based Practice- Developing a Model of Care based on clinical practice guidelines.
53	Nguyen, Sylvia	Efficacy of Cognitive Behaviour Therapy in treating fatigue and sleep disturbance following acquired brain injury: a pilot randomized controlled trial
54	Owens, Jacqueline	The Relationship between Integrity of the Medial Forebrain Bundle and Attention and Working Memory following Traumatic Brain Injury
55	Pais, Celia	Factors Associated with Post-traumatic Growth Following Traumatic Brain Injury
56	Palit, Mithu	Development of referral coordination for access to Victorian Acquired Brain Injury (ABI) Rehabilitation Service beds.
57	Patterson, Freyr	Group therapy interventions in traumatic brain injury rehabilitation: Clinicians perceptions of processes and effectiveness
58	Pihl, Sahra	A multidisciplinary team approach: Enabling a client to re-engage in meaningful leisure pursuits and productivity
59	Power, Emma	Early conversational recovery of people with severe Traumatic Brain Injury and their communication partners
60	Prescott, Sarah	A systematic scoping review of goal planning approaches and principles used in rehabilitation for people with acquired brain injury
61	Ramsden, Clare	Musical hallucinations following acquired brain injury
62	Rietdijk, Rachael	Using videoconferencing to evaluate conversations between people with traumatic brain injury and their usual communication partners
63	Rietdijk, Rachael	A pilot study of the use of telehealth for social communication skills training for people with traumatic brain injury and their usual communication partners
64	Rose, Anita	A comparative study of carer burden and emotional distress experienced by family and formal caregivers after Traumatic Brain injury
65	Rose, Anita (Dhamapurkar, Samira)	Effect of Modafinil on Level of Consciousness: A Pilot Study
66	Sansonetti, Danielle	Barriers and enablers to articulating occupational role performance after acquired brain injury
67	Scheenen, Myrthe	Complaints following Mild Traumatic Brain injury (mTBI) and the role of Coping
68	Seaman, Karla	Using technology to improve care delivery: audio visual care plans as an adjunct tool
69	Seaman, Karla	Changing mindsets on time in ABI rehabilitation – waste of resources or necessity?
70	Sharp, Kristylee	Optimising function in degenerative disease
71	Shibasaki, Mitsuyo	Early Perceptual Processing of Faces in Patients with Traumatic Brain Injury: An Event-Related Potentials Study
72	Stobie, Julianne	Quality of life for individuals with a vestibular impairment following an acquired brain injury: the person's perspective.
73	Sullivan, Karen	The Influence of diagnostic terminology on expected acute and chronic symptoms from sport-related mild traumatic brain injury
74	Theadom, Alice	Experiences of working with people with acquired brain injury in the research context
75	Theadom, Alice	Sleep difficulties one year following mild traumatic brain injury in a population based study
76	Thomasz, Tennille	Clinical practices surrounding friendship following TBI
77	Vassallo, Suzane	Chronic visual deficits following traumatic brain injury
78	Watter, Kerrin	Developing a reading comprehension intervention for adults following ABI
79	Weir, Stephanie	Patterns of narrative discourse in early recovery following severe Traumatic Brain Injury
80	Winegardner, Jill	"Fatigue is part of who I am and the life I want to lead": Implementing a clinical model to guide intervention and evaluate outcomes

81	Withiel, Toni	Cognitive and Functional Outcomes after Traumatic Brain Injury: An investigation of COMT Val158Met
82	Wong, Dana	Running a memory group with participants with acquired brain injury (ABI) in a university clinic context: Process and preliminary outcomes
83	Wood, Rebecca	Mainstream and assistive technology use by people with acquired brain injury living in shared supported accommodation
84	Yates, Susan	Observations from a New Zealand Memory Team

FRIDAY POSTER ABSTRACTS

Interested, annoyed or suspicious? A new test of complex emotions for adults with Traumatic Brain Injury (TBI)

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Objective: To examine whether moderate-severe TBI results in a specific impairment in perception of some emotions compared to others, or in a general difficulty in emotion perception. In addition, we aimed to determine whether emotion perception deficits might be accounted for by other cognitive processes, and whether emotion perception predicts social functioning following TBI.

Method: Participants: thirty-two participants with TBI and 32 matched controls. **Design:** all participants completed CAVEAT, a novel measure of emotion recognition, and measures of neuropsychological functioning. TBI participants also completed self-report measures of psychosocial functioning.

Results: The TBI group performed more poorly in recognising all emotions, rather than displaying a selective impairment in recognising some emotions compared to others. Although processing speed, non-verbal reasoning, and working memory were associated with emotion recognition, injury severity and non-verbal reasoning were the sole predictors of CAVEAT performance. Emotion recognition performance in the TBI group was associated with self-reported disinhibition and number of friends.

Conclusion: Impairment in emotion recognition deficits are a direct consequence of TBI, and have a direct effect on the associated social dysfunction, strengthening the need for targeted remediation of these deficits.

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Social disinhibition: Piloting a new clinical measure in traumatic brain injury (TBI) individuals

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Background and aims: Deficits in social disinhibition are common in traumatic brain injury (TBI). Measures of inhibitory control (e.g., Haylings Sentence Completion test) are often used clinically to infer emotion regulation difficulties following TBI. However, these tests may not measure the same type of disinhibition that occurs in social contexts. This study aimed to: (1) to examine whether individuals with TBI are impaired in (a) inhibiting automatic verbal responses to complex social information (b) producing socially acceptable positive responses; and (2) to develop a

new task that can detect social disinhibition deficits in clinical settings.

Method: Participants (19 moderate-to-severe TBI and 14 healthy controls) viewed scenes of complex social situations, and were asked to describe a character in them (Part A), describe a character while inhibiting inappropriate or negative responses (Part B), and describe a character while not only inhibiting negative responses, but also providing positive utterances (Part C).

Results: While TBI individuals and healthy control participants responded similarly to Part A, TBI individuals were significantly impaired on Part B indicating that they experienced difficulties in inhibiting automatic responding. There was a trend towards impairment on Part C in TBI individuals, suggesting difficulties with the ability to produce positive and more socially acceptable responses.

Conclusions: This pilot study makes an important contribution toward meeting the need for a well-validated clinical assessment tool that can assess social disinhibition deficits in those with TBI.

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A modified version of the Social Skills Performance Schedule for evaluating social skills in traumatic brain injury

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Background and objectives: Reductions in social functioning are a common, debilitating consequence of traumatic brain injury (TBI), therefore, there is a need for a tool to assess social skills in this population. The Social Performance Survey Schedule (SPSS) is useful in this regard but many scale items are not suitable for a TBI population. This study examined a 41-item revised version of this scale (SPSS-R).

Method: To assess convergent validity of the scale, 49 friends or family members of an adult with TBI completed the SPSS-R, the Sydney Psychosocial Reintegration Scale (SPRS), Neuropsychiatric Inventory – Disinhibition subscale and Current Behaviour Scale. 23 individuals with severe TBI were additionally administered The Awareness of Social Inference Test (TASIT) as an objective test of social function.

Results: The scale showed good internal consistency ($\alpha = .732$). Moderate to strong correlations were observed between scores on the SPSS-R and occupational, relationship and leisure outcomes measured by the SPRS ($r = -.452$ to $-.677$). Higher scores on the SPSS-R were associated with greater frequency, severity, and distress related to disinhibited behaviours on the NI-D ($r = .515$ to $.644$). There was a moderate correlation with the emotional control subscale of the CBS ($r = .433$) and with observed social functioning on TASIT Part 3 ($r = .373$) but not Parts 1 or 2 ($r = .235$ to $.301$).

Conclusions: The SPSS-R has both internal reliability and construct validity, attesting to its value for assessing social functioning in a TBI population.

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Developing an Observational Measure of Social Disinhibition after Traumatic Brain Injury Osborne-Crowley, Katherine¹; McDonald, Skye¹ and Francis, Heather M.¹

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Background and aims: Measurement of social disinhibition after traumatic brain injury (TBI) has been inconsistent across studies, often subject to patient and informant bias. This study aimed to develop an observational measure of socially disinhibited behaviour for use in a TBI population.

Method: 21 adults with severe TBI (mean age 50.10 years) and 21 control participants (mean age 45.29 years) were videotaped interacting with an experimenter. Interactions were rated by two blind, independent raters for disinhibited behaviours. Participants also completed tests of inhibition, working memory and processing speed. Relatives of participants with TBI completed the Neuropsychiatric Inventory (NPI; Cumming et al., 1994) and Sydney Psychosocial Reintegration Scale (SPRS; Tate et al., 1999).

Results: Inter-rater absolute agreement for social disinhibition ratings was good, ICC=.69. Mean ratings provided for TBI participants had significantly larger variance than controls, $F=8.25, p=.006$. In the TBI group, the ratings were positively correlated with the NPI frequency ($r=.49, p=.023$) and distress scores ($r=.46, p=.034$). A hierarchical regression predicting social disinhibition ratings in the TBI group revealed that the addition of formal inhibition measures led to a significant increase in R^2 of .382, $F(2,10)=6.45, p=.016$.

Conclusions: The observational measure demonstrated good inter-rater reliability and construct validity. Formal measures of inhibition were shown to predict observed social disinhibition. The social disinhibition ratings, however, were unable to predict outcomes such change in employment or in interpersonal relationships.

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Willing or not? Problems understanding sincerity after severe Traumatic Brain Injury

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Background: Many people with severe traumatic brain injury (TBI) have difficulties understanding indirect language, e.g. sarcasm. But do they have problems judging the relative sincerity of speakers who, while not frankly sarcastic, are less than sincere in their remarks?. This study examined perception of sincerity and its relation to cognitive impairments (e.g. working memory) and social cognitive abilities (e.g. emotion perception).

Methods: 24 adults with severe TBI and 25 adults from the community watched video vignettes of four actors volunteering for additional duties. Each speaker made a remark that literally suggested they were willing to be involved. Their sincerity, however, was moderated by their emotional demeanour. Participants rated each speaker for sincerity (0-100%). Measures of cognitive and social cognitive function were also taken.

Results: The TBI group was less consistent ($\alpha = 0.65$) in how they ranked sincerity of the actors compared to the control groups ($\alpha = 0.90$). They were worse at differentiating between

sincere and insincere expressions and rated insincere expressions as more sincere, although they rated sincere expressions similarly. Poorer working memory and poor social cognition were associated with these difficulties detecting insincerity and sarcasm in the TBI group but only social cognition was uniquely associated.

Conclusions: Adults with TBI have difficulty detecting not only sarcasm, but relatively insincere remarks. This seems to be specifically related to poor social cognition abilities.

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The Explicit and Implicit Audition of Emotions: An ERP Investigation of Vocal Emotion Perception Deficit Following Severe Traumatic Brain Injury.

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Background and aims: Reduced ability to perceive vocal expression of emotions may significantly impact psychosocial adjustment and functioning following severe traumatic brain injury (TBI). Utilizing event-related potential (ERP) analysis, the present study aimed to investigate the neural mechanism underlying vocal emotion perception (Schirmer & Kotz, 2006) and its deficits following severe TBI.

Method: Fifteen adults with severe TBI and 15 demographically-matched healthy control (HC) participants completed two oddball tasks whilst electroencephalography (EEG) equipment recorded neural responses to vocal stimuli at early stages (100-250ms) and late stages (250-750ms) of processing. In the explicit emotional evaluation oddball task participants were told to click in response to rare presentations of emotional tones in voices (i.e., happy, angry and disgust) embedded within frequent presentation of neutral tones. In the implicit emotional evaluation oddball task participants were instructed to click in response to rare presentations of neutral voices embedded within frequent presentations of emotional voices.

Results: During explicit emotional evaluation TBI participants elicited significantly delayed neural responses at early (150-250ms) and late (250-750ms) stages of processing, across all vocal stimuli. However, during the implicit emotional evaluation TBI participants only exhibited significantly delayed neural responses at late (400-750ms) stages of processing.

Conclusion: The findings of this study suggests that TBI deficits in neural processing speed may have accounted for reduced perception of emotional tones in voices during conditions of explicit evaluation.

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Impaired reversal learning and attenuated feedback-related negativity amplitude in traumatic brain injury patients compared with controls

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Background and aims: Acquired social disinhibition after a severe traumatic brain injury (TBI) is a particularly distressing outcome for the individual, their family and the community (Brooks & McKinlay). Reversal learning deficits caused by damage to the orbitofrontal cortex (OFC) may underlie this debilitating disturbance of social behaviour (Rolls, 1994). The

current study aimed to determine whether reversal learning impairments were associated with social disinhibition in a TBI sample.

Method: Participants with TBI (19 males, mean age 46.9 years) and a control group (18 males, mean age 45.29 years) completed a social and a non-social reversal learning task. Performance (number of errors) and the feedback-related negativity (FRN) elicited by error feedback were examined. Participants were also rated on their level of social disinhibition by two independent, blind raters based on a videotaped interview.

Results: Participants with a TBI made more reversal errors, $F(1,36)=4.229$, $p=.047$, $\eta=.105$, and produced smaller amplitude FRN's, $F(1,35)=5.028$, $p=.031$, $\eta=.126$, on the social and non-social reversal learning task compared with control participants. Further, participants with a TBI who were rated as high on social disinhibition (based on a median split) made more errors on the social reversal learning task than did those rated as low on social disinhibition.

Conclusions: Participants with a TBI demonstrated an impaired ability to update behaviour following both social and non-social reward contingency change and were impaired in their neural response to these contingency changes. This indicates that the FRN can provide a marker of reversal learning impairments after TBI. Further, these neural and behavioural impairments may contribute to acquired social disinhibition after TBI.

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Enduring effects of Ostracism in Autism Spectrum Disorder: A physiological approach

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Background and Aims: Social exclusion or ostracism is experienced by most people at some point in their lives. This is even greater for individuals with Autism Spectrum Disorder (ASD). Individuals with ASD experience difficulties making and maintaining friendships as well as difficulties with social communication, often leading to feelings of isolation and social exclusion. Very little research has examined the perceptions and emotional experience of individuals with ASD when they are being ostracized. This study aims to explore the emotional and psychophysiological responses to ostracism in individuals with ASD.

Method: Twenty-five individuals aged 16 or older (21 males; mean age 27 years) with a diagnosis of ASD and twenty-six matched controls (21 males, mean age 26) participated in an online game of ball tossing, Cyberball. Each participant played two games, both against fictional players: one game in which they were excluded from the game and another in which they were included and the ball was shared equally between players. Whilst playing, participants' arousal level was monitored via skin conductance. Participants were also required to complete a self-report questionnaire about their experience and mood after both games.

Results: Individuals with ASD showed increased arousal compared with controls when playing the game ($p < .001$), both when excluded and included. Furthermore, individuals with ASD demonstrated higher levels of arousal when excluded from the game compared with when they were included. Individuals with ASD did not demonstrate habituation of arousal over the course of the game, as controls did. Psychological responses indicated that individuals with ASD showed similar patterns of responses to controls and shared the same social needs and mood.

Conclusions: The present findings suggest that, when excluded, individuals with ASD exhibited greater emotional

response to the game compared to controls. This would suggest that they are more sensitive to ostracism and these effects do not dissipate as quickly as controls. However, these elevated physiological effects of ostracism are not recognised and interpreted as emotionally salient by individuals with ASD.

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Exploring the impact of traumatic brain injury on moral reasoning and how this relates to executive functioning, empathy and emotion-based decision making

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Background and Aims: Traumatic brain injury (TBI) leads to cognitive, behaviour, and social functioning difficulties, and is associated with increased risk of offending behaviour. Fronto-temporal brain regions are commonly affected in TBI and these regions are considered important for moral reasoning. Moral reasoning is important for upholding social function and preventing delinquent behaviour. Studies to date have indicated that there are greater difficulties in moral reasoning following a childhood TBI than adulthood TBI. The current study aimed to: i) examine the impact of childhood TBI on moral reasoning in early adulthood; ii) explore the neurocognitive processes underpinning moral reasoning in young adults with TBI.

Methods: Twenty survivors of TBI aged 17-25 years and 34 age-matched non-brain injured participants completed the Sociomoral Reflection Measure - Short Form (SRM-SF, Gibbs, Basinger & Fuller, 1992). The relationships between moral reasoning and executive functions, cognitive flexibility, inhibition, empathy, and emotion-based decision making were also explored.

Results: The healthy comparison group demonstrated significantly higher moral reasoning. This was maintained when the groups were matched on age, sex, socioeconomic status and when intellectual functioning was controlled. Significant relationships were found between moral reasoning and cognitive flexibility, inhibition, executive function difficulties and empathy in the healthy comparison group. Only one significant correlation was revealed in the TBI group: between cognitive flexibility and moral reasoning. This was attributed to insufficient power to detect other significant findings.

Conclusions: TBI sustained during childhood does disrupt moral development. Executive processes and empathy may be involved in moral reasoning.

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Investigation into the frontal lobe functioning of young offenders with and without a head injury

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Background and aims: Recent research has established a high prevalence of head injuries in the adult and youth offending populations. Offenders often have difficulties with tasks that involve frontal lobe functioning compared to non-

offenders, but research has often not controlled for the effect of head injury. This research aimed to investigate whether young offenders in the community, with self-reported traumatic brain injury (TBI), perform differently to young offenders without a TBI on tasks that are associated with frontal lobe functioning.

Method: Participants completed a battery of assessment measures that related to four aspects of frontal lobe functioning. In addition measures of mood, socio-economic status (SES) and IQ were taken as possible confounding variables. A total of 20 participants were recruited in the TBI group and 15 in the non-TBI group. Participants were aged between 12-17 years old and had past/current involvement with Youth Offending Services.

Results: The TBI group had significantly lower IQ and SES than the non-TBI group but similar levels of self-reported depression. The TBI group were more impulsive on an inhibition task and were poorer at intuitive emotion-based decision making, and reading emotions from the eyes. There were no significant differences between the groups on reaction time tests.

Conclusions: The study concluded that within this sample of young offenders, those with a self-reported head injury had poorer performance on some tasks associated with frontal lobe functioning, but not others. The findings are considered in the context of theoretical and clinical implications with suggestions for further research.

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Validating a parent-rated working memory questionnaire for children

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Background and aims: Working memory (WM) deficits in childhood can have adverse consequences for education and home/everyday life. To date, there is no well-known ecological measure that examines WM in the home/everyday context. The current three studies aimed to explore the functionality of a newly developed parent-rating of WM for children.

Methods: The parent-rated WM questionnaire (WMQ-P) was developed and tested on 51 typically developing children (Study 1 & 2) and 21 children with acquired brain injury (ABI; Study 3). Responses on the WMQ-P were correlated against two well-known parent-rated measures of executive function (EF; BRIEF) and attention (CRS-R; Study 1 & 3), a teacher-rated measure of WM (WMRS; Study 1), and a standardised computerised assessment of WM (AWMA; Study 1 & 3). Test-retest reliability of the WMQ-P was also assessed over a two-week period for typically developing children (Study 2).

Results: The WMQ-parent significantly correlated with measures of EF, attention, and WM in typically developing children; it also showed a high level of test-retest reliability. In children with ABI the measure showed correlations with parent-ratings of EF and attention, but did not correlate with a standardised computerised assessment of WM.

Conclusions: Findings indicate that the WMQ-P is a reliable and valid indicator of WM in typically developing children in the home-context. In children with ABI it is possible that the measure may act as a better indicator of EF, rather than WM specifically. This hypothesis needs to be tested with a larger sample and objective measures of EF.

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Ecological Assessment of the Supervisory Attentional System in People with Intellectual Disabilities

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Background and Aims: The aims of the current study were to adapt a version of the Multiple Errands Test for people with intellectual disabilities (IDs) and assess its ecological and construct validity.

Methods: Using a correlational design, 40 participants with IDs were invited to complete a battery of neuropsychological assessments, including the modified Multiple Errands Test for Intellectual Disabilities (mMET-IDs).

Results: Task completion on the mMET-IDs correlated significantly the Tower of London Test and the Six Parts Test. These findings suggest that the mMET-IDs has construct validity. The findings, however, also showed that the relationship between the mMET-IDs and the Six Parts Test could be accounted for by Verbal IQ and receptive vocabulary. Also, the mMET-IDs failed to correlate with the DEX-IR and its subscales.

Conclusions: The mMET-IDs can be successfully used with people with IDs, but further research is needed to improve ecological validity.

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Why should we bother to collect routine outcome data? How can we use it to enhance our understanding of client needs and improve outcomes in the NSW Brain Injury Rehabilitation Programme

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Background: Transitional living units play an important role as part of the rehabilitation continuum. There are three primary clinical pathways which reflect differences in the focus of intervention, time since injury and length of stay. Effective evaluation needs to consider the impact of these differences on outcomes.

Aims: This paper aims to examine differences in TLP client characteristics and outcomes for each clinical pathway and describe how routine outcome data can be used to identify clinically relevant quality improvement priorities for the whole caseload.

Data were evaluated for 176 clients including 121(69%) Transitional living, 31(18%) Community resettlement and 24(13%) Community management clients. Chi square and Kruskal-Wallis tests demonstrated differences in injury circumstances ($p < .05$), rural/metro location ($p < .001$), length of stay ($p < .05$), time since injury ($p < .001$) and age at injury ($p < .05$).

The ANOVA was significant for all types of outcome measure analysed: MPAI raw change ($F = 5.418, P < .05$), SMAF change ($F = 8.332, P < .001$). Post hoc tests demonstrated significant difference in outcomes between clients in Transitional living and Community management pathways, but not between Community Management and resettlement. An outcomes workshop summarised complex statistical results for TLP clinicians. A dynamic service evaluation approach was used identify six clinically relevant priorities to improve client outcomes.

Conclusions: Routine outcome measurement provides ongoing evidence of service and client outcomes. Clinicians need to be able to understand the results to enable them to identify clinically relevant issues and agree strategies to

improve services.

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Treating child behavior problems: parent and child outcomes following a group parenting intervention in a clinical pediatric rehabilitation setting

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Background and objectives: Emotional and behavioral difficulties are a common concern of families presenting to rehabilitation services. These difficulties have the potential for significant impact on child and family rehabilitation outcomes. Research literature indicates growing evidence for the efficacy of parent training interventions in management of behavioral problems in both children with acquired brain injury and developmental disability. The aim of this project was to evaluate the efficacy of one such intervention, the 'Signposts – building better behaviour' program in reducing child behavior problems and improving parental practices and well-being.

Method: Twenty-eight parents of 26 children (aged 2-10) attending the Victorian Paediatric Rehabilitation Service at the Royal Children's Hospital completed the 6 week program run on 3 separate occasions. Pre and post intervention measures included parental report of child behavior, strengths and difficulties and parent self-report of psychological symptoms, parenting practices and sense of competence.

Results: Significant improvements in parental sense of competence (parental efficacy) and parenting practices were apparent at completion of the program. No significant intervention effects were observed for child behavior ratings, though a trend towards improvements in conduct problems was observed. No changes were observed in parental self-report of stress, anxiety or depression.

Conclusions: The findings have implications for management of child behavior problems in rehabilitation settings. Overall initial results indicate support for the efficacy of the 'Signposts' program in improving parental practices and sense of competence. Direct impacts on child behavior were inconclusive at immediate follow-up, and warrant ongoing investigation.

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Can EBIQ identify change in ability to make friends?

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Background and aims: Friendships may be disrupted by disability. Often people living with brain injury present difficulties in fostering and maintaining relationships. This research aimed to investigate the usefulness of European Brain Injury Questionnaire (EBIQ) as a measurement of ability to participate in friendships after completing a neurorehabilitation programme.

Method: Eight items of the 66 questions were selected as related to the concept of friendship (6, 8, 12, 17, 19, 30, 39 & 40). Eighty-two adults participated (mean age = 36.25, SD = 11.54). The means of pre (T₁) and post (T₂) measures were compared using a T-test; the difference between T₁ and T₂ was

calculated; and the frequency in which each value occurred was verified (range -2 to 3, negative numbers mean decline). **Results:** There was a significant difference between T₁ and T₂ mean scores ($t(81)=40.08$, $p<.000$). Analysing each question, we found high frequency of improvement on Q30 (feeling lonely) 48.9%, Q6 (others do not understand your problems) 45.6%, and Q8 (being unable to plan activities) 44.4%. Q17 (hiding your feelings from others) showed the lowest percentage of change (30% improved). Q39 (thinking only of self) showed 53.3% reported no change at all.

Conclusions: Results suggest EBIQ may provide a subscale which could be a useful measurement of ability to participate in friendships after completing a neurorehabilitation programme. Reported changes appear to be associated with participation in the neurorehabilitation programme.

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Selection bias in RCT trials in cognitive rehabilitation after acquired brain injury (ABI)

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Background and aims: Clinical trials to evaluate effectiveness of cognitive rehabilitation require relatively homogeneous patient groups likely to benefit from the studied intervention (Cicerone et al 2000). ABI results in heterogeneous symptoms depending on illness or injury characteristics. Thus, results are only applicable for the selected group of patients and possible generalizations should be under careful scrutiny. It is highly recommended to record data on the total patient population, which the participants are recruited from (Moher et al 2001) However few studies report the effects of strict enrollment criteria and the resulting selection. The aim of the present study is to examine the selection process of a large RTC study on the effects of attention training early after ABI (Bartfai, et al, 2014) and investigate the effect of patient selection on the generalization of the results.

Method: All in- and outpatients with stroke or traumatic brain injury within the first year after ABI in a specialized rehabilitation hospital were screened for inclusion. Computerized screening logs were used to follow patients during the recruitment phase.

Results: In total 992 patients were screened. The selection process comprised three major steps, 1. Diagnosis (TBI or stroke), time frame for inclusion (<12 months after injury/illness), age <60, occurrence of additional diagnoses 2. Neuropsychological screening as per selection criteria 3. Informed consent, occurrence of personal or organizational factors. Finally 108 patients were enrolled. The two major excluding factors were age >60 (n=161) and aphasia (n=82). Differences between included and excluded patients with regard to selection criteria and other factors influencing selection are analyzed.

Conclusions: The results highlight the need for reporting data from the total patient population for intervention studies and redirect focus on the effects of selection criteria.

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Changes to emotional and behavioural self-concept after TBI: Associations with threat appraisals and emotional distress

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Background and aims: The events that cause and occur after traumatic brain injury (TBI) are life changing and affect people's sense of self. Focusing on self-perceived emotional and behavioural attributes, this study aimed to investigate the nature of changes to self-concept (self-discrepancy) and its associations with threat appraisals and emotional distress after TBI.

Methods: Participants were 82 adults (64 males) with mild to severe TBI aged 18 – 67 years ($M= 40.62$, $SD= 14.23$) living in the community. They were administered measures of pre-injury and current self-concept (Head Injury Semantic Differential Scale - III), threat appraisals (Appraisal of Threat and Avoidance Questionnaire), and emotional distress (Depression Anxiety and Stress Scale).

Results: Approximately two thirds of the sample reported an overall negative self-discrepancy since TBI. Nevertheless, continuity of self was reported for certain attributes (e.g., hopeful, stable, and calm). Correlation analyses revealed that people with poorer current self-concept and more negative self-discrepancy reported higher levels of emotional distress. Furthermore, the relationship between self-discrepancy and emotional distress was mediated by threat appraisals (95% bias-corrected CI = $-.16$ to $-.03$ for depression; CI = $-.19$ to $-.06$ for stress).

Conclusions: The findings indicate that people with TBI experience predominantly negative changes in emotional and behavioural self-concept, which are related to an increased sense of threat regarding daily activities and emotional distress. Prospective longitudinal research is needed to investigate the development of negative self-discrepancy and its contributing factors.

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Improving the fidelity of behavioural treatments for people with brain injury: Describing the process for project-based treatment

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Background and aims: Establishing treatment fidelity is important to ensure that a treatment has been implemented as intended and helps to make decisions about treatment efficacy and replication [1,2]. Fidelity checking is challenging for complex behavioural treatments [3], which are flexible and responsive to the people involved [4]. A recent review of aphasia treatment studies revealed that only 14% of studies (21/149) explicitly reported treatment fidelity [5]. This paper aims to: (1) identify the proportion of brain injury treatment studies that report fidelity and; (2) describe the process of fidelity checking for project-based treatment (PBT).

Method: A selection of brain injury treatment studies published 2000-2014 were recently reviewed for treatment outcome [6]. Fidelity practices for these studies were checked. To describe fidelity for PBT, a list of observable behaviours for coding was created and checked by the trainer following each treatment session. Prospective fidelity checks were undertaken by independent raters for 11% of the data from the first four PBT groups to ensure no therapist drift.

Results: Of the brain injury treatment studies that were reviewed, 14% reported treatment fidelity (11/81). For PBT, a list of 19 behaviours for coding was created. Of these, 4 related to the treatment overall, 10 were therapist behaviours and 5 were participant behaviours. Initial inter-rater agreement for fidelity checks was 72%, which increased to 90-100%

when coding behaviours were more clearly defined. Raters agreed that no behaviours were absent.

Conclusions: Fidelity checks are important to enhance the reliability and validity of behavioural treatments. However, only a small percentage of brain injury treatment studies report fidelity. This study reports on the process of fidelity checking for a flexible and individualised treatment for people with brain injury.

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Making use of goal attainment scaling (GAS) to improve communication skills following project-based treatment for people with acquired brain injury (ABI)

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Background and aims: GAS is a method for quantifying progress towards rehabilitation goals, which has been widely reported for people with ABI [1-5]. Communication impairments are common following an ABI and recent treatment studies have successfully used GAS to document changes in social communication skills [6,7]. This study aims to examine the use of GAS for people with ABI following project-based treatment [8], an innovative alternative for the treatment of communication skills post-injury.

Method: Twenty-one people with ABI and impaired communication were recruited to participate in a group-based social communication treatment, which comprised 10 sessions over six weeks (20 hours in total). Specific goals were collaboratively set using GAS pre-treatment with the person with ABI and their communication partner. The goals were texted to both participants at regular intervals during the treatment. Goals were then rated separately by both participants, post-treatment and at follow-up. Data was analysed to identify achievement of GAS goals.

Results: Thirteen people with ABI could recall their goals independently within four sessions and a further six within eight sessions. Paired samples t-tests showed significant

treatment effect post-treatment on GAS goals as rated by both the person with ABI ($p < 0.0005$) and their communication partner ($p < 0.0005$). No significant difference between post-treatment and follow-up ratings was found for either the person with ABI ($p = 0.261$) or communication partner ($p = 0.136$). There was no significant difference between how the person with brain injury or communication partner rated the GAS goals at either time point.

Conclusions: This study highlights the importance of setting individualised collaborative communication goals for people with ABI. The use of GAS as a method for structuring goals, involvement of communication partners and text-message reminders are useful strategies to improving a person's communication skills post-injury. Moreover, a person with ABI can rate achievement of goals as well as their communication partner.

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Families4Families Inc: Evaluating outcomes of participation in a South Australian peer support network for families following acquired brain injury

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Background and aims: *Families4Families Inc* began as an 18-month pilot peer support network for families living with acquired brain injury (ABI) in South Australia. This Stage 2 research study aimed to identify the benefits and limitations of the program, and evaluate outcomes of participation in relation to quality of life, care giving experiences, mental health and support needs over time.

Method: Following the program's launch in January 2013, all members were invited to participate in an initial phone interview and complete a series of questionnaires (WHOQoL-BREF; DASS-21; CAS-M). Fifty-five members (20 pwABI; 35 caregivers) participated (43% response rate). Final phone interviews ($n = 34$) and questionnaires ($n = 42$) were repeated at the end of the 18-month pilot in June 2014.

Results: 71% participated in *Families4Families Inc* as either active ($n = 12$) or occasional ($n = 27$) attenders, with 16 (24%) non-attenders. Thematic analysis of post-program interview transcripts revealed three major benefits from participation: 'information'; 'giving back'; and 'connection'. Both active and occasional attenders reported statistically significant increases in self-rated 'knowledge of services available' over time, with active attenders developing significantly more friendships and contacts than occasional attenders. Non-significant improvements in overall quality of life scores were reported by active attenders, in contrast to mean decreases for both occasional and non-attenders.

Conclusions: Although questionnaire results did not reveal any significant differences in quality of life, mental health or caregiving appraisal over time, qualitative feedback indicated benefits through sharing and learning from each other's experiences, knowledge, positive coping strategies, understanding of systems, and expansion of social networks.

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Long-Term Cognitive Outcomes After Paediatric Liver Transplantation: Waiting time matters

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Background and Objectives: Liver transplantation is now standard therapy for children with end-stage liver disease. As survival rates post-transplant have improved, the focus has shifted to long-term outcomes. However, due to low organ donation rates, children are forced to wait for donor livers, leaving them vulnerable to the neurotoxic effects of end-stage liver disease. The aim of the study is to investigate whether children who wait longer have poorer outcomes.

Method: Twenty-six children (13 female) aged between 6 and 16 years ($M: 10.6$, $SD: 3$), who were at least one year post-transplant, were recruited and assessed using a comprehensive neuropsychological battery. Medical factors of interest were collected from medical records.

Results: Compared to population norms, participants perform significantly worse on measures of attention and working memory, fine motor skills and mathematics, with 50% meeting criteria for a learning disability in mathematics. Backwards regression models found that medical factors of interest, including time spent on waiting list, disease severity and days spent in intensive care, significantly predict long-term cognitive outcomes.

Conclusions: The findings from the study demonstrate that longer waiting times and greater disease severity at transplantation predict poorer long-term cognitive outcomes. These findings should inform future allocation policies to get livers to children more quickly and give children with end-stage liver disease a healthier start to life.

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Treating impaired self-awareness in adults with traumatic brain injury (TBI): A literature review and case study implementation

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Background and Aims: Self-awareness is the knowledge of one's strengths and weaknesses, and ability to self-monitor and self-regulate behavior. It is frequently impaired in TBI, particularly in less visible disorders such as cognitive and communication impairments, and may hinder rehabilitation/recovery. We aimed to: (i) review the literature on treatment of self-awareness impairments following TBI, and (ii) implement and evaluate a self-awareness treatment program for a TBI client with dysarthria.

Method: A database search and literature review was conducted to evaluate the evidence for treating self-awareness impairments in adults with TBI. Quality of the evidence was rated according to the NHMRC Levels of Evidence and the ROBIN-T Scale (Tate et al., 2013). Based on the review, we piloted an awareness treatment protocol with a 35 year old man who sustained a severe TBI. He presented with dysarthria with difficulty generalizing 'clear speech' strategies in the community due to impaired self-awareness. Metacognitive techniques identified in the literature review were implemented before and after functional, community-based interactions (e.g. ordering coffee).

Results: There is an emerging evidence for the effectiveness of metacognitive interventions (e.g., verbal/video feedback) in improving self-awareness in TBI. Across six sessions, patient and speech pathologist ratings of patient performance increasingly aligned. The patient was also better able to recall specific 'clear speech' strategies over the six sessions and the patient required less prompting to use strategies during the task. Improved awareness facilitated greater participation and independence with community interactions.

Conclusions: Our preliminary implementation is promising for further trials of self-awareness based interventions for people with cognitive-communication impairments.

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Conversation topics following severe traumatic brain injury: a study at three and six months post-injury

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Background and aims: People with TBI may have problems managing conversational topics. However, the nature and meaning of topics and recovery of these discourse abilities during sub-acute recovery is largely unknown. This study investigated the patterns and nature of conversation topics discussed by people with severe TBI and a familiar communication partner at 3 and 6 months post-injury, and changes occurring in conversational topics during sub-acute recovery.

Method: Twenty two people with severe TBI and a familiar communication partner engaged in a 10 minute casual conversation on self-selected topics at 3 and 6 months post-injury. Topic analysis (Mentis and Prutting, 1991) provided an understanding of conversational topic management by identifying patterns of topic initiation and maintenance. Qualitative content analysis (Sandelowski, 2000) was used to explore the nature of topics and generate conversational themes.

Results: Most conversational dyads maintained similar patterns of topic initiation during sub-acute recovery. Three main conversational themes were identified: connecting; re-engaging; and impacts of injury. The nature of conversation topics related to these themes changed subtly over time, reflecting participants' sub-acute rehabilitation experiences.

Conclusions: Qualitative analysis provides a new insight into conversation topics of people with severe TBI. Many people with severe TBI can engage in appropriate conversations and discuss mutually important topics with a familiar communication partner. Findings may inform speech-

language pathology intervention in sub-acute recovery to improve discourse abilities of individuals with TBI.

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Tweets and Friends: Using Social Media after Traumatic Brain Injury

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Background and aims: Social media offers people with a Traumatic Brain Injury (TBI) an important way to connect with family, friends and the community. However, little is known about how people with TBI use social media. The aim of this study was to systematically review literature relating to the use of social media by people with a TBI.

Method: In June 2014, 10 scientific databases were searched for peer-reviewed research relating to both TBI and social media. We examined the characteristics and findings of 16 studies meeting the inclusion criteria to look for aspects of social media use by people with TBI.

Results: Analysis of results across the 16 studies revealed three main categories of content themes on the use of social media by people with TBI: 1) risks and benefits; 2) barriers and facilitators; and 3) purposes of use. Risks and barriers to social media related to concerns regarding: Internet safety, cognitive or behavioural disability, and accessibility issues. Few strategies were described as facilitators to successful use of social media. Social media may be used by people with TBI to enhance access to information, communication and social connection.

Conclusions: There are a wide range of benefits to the use of social media by people with TBI, but there is a paucity of research evaluating its use or supports that might enhance or enable successful use and engagement in online communities. In this paper we will outline the implications for rehabilitation of people with TBI and directions for future research.

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Examining the validity of the AUDIT and DAST in screening for substance use disorders following TBI

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Background and aim: Substance use disorders are common following traumatic brain injury (TBI). They are most common in individuals with a pre-injury history of alcohol or other drug abuse or dependence. Substance use declines in the first year following injury with consumption typically approaching pre-morbid levels over time and peaking at 24 months post-injury. Nonetheless, screening does not regularly occur in rehabilitation settings. The "gold standard" of assessment is the structured clinical interview for the Diagnostic and Statistical Manual of Mental Disorders (SCID). However, administration of the SCID is time-consuming and requires clinical training, which is impractical in many clinical settings. The aim of this study was to examine the validity of the Alcohol Use Disorders Identification Test (AUDIT) and the Drug Abuse Screening Test (DAST) in a TBI sample 24 months post-injury. The

AUDIT and DAST are brief and are widely recommended rating scales in the general population.

Method: 113 individuals (87 males) with complicated mild to severe TBI were recruited from the TBI rehabilitation program at Epworth Hospital, Victoria, Australia. Participants completed the AUDIT, DAST and the SCID at regular intervals to prospectively document substance use over time. The SCID was used as the gold standard criterion.

Results: In individuals with TBI at 24 months post-injury, a cutoff score of 11 on the AUDIT may be the most appropriate indicator of alcohol use disorder. A cutoff score of 6 on the DAST was an appropriate indicator of drug use disorder. Both screening measures demonstrated excellent diagnostic accuracy at 24 months following injury.

Conclusion: The optimal cutoff score for the AUDIT may need to be elevated for use following TBI. Nevertheless, both the AUDIT and the DAST are suitable measures for assessing substance use following TBI. Given the importance of uniformity in post-injury assessment, the AUDIT and the DAST may serve as future screening standards in TBI research.

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“A place of my own”: Experiences and outcomes of adults with acquired neurological disabilities living in a new supported housing model.

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Background and aims: Recently in Australia, some integrated models of housing have been established within mainstream residential developments, offering new options for people living with disability and high support needs. This research aimed to: 1) investigate the lived experience of people with acquired neurological disability moving into a new smart home apartment development in Melbourne and 2) undertake longitudinal evaluation of participants' health, independence and participation outcomes.

Method: *Design:* Mixed methods case series. *Participants:* Four adult males with acquired neurological disabilities (ages 37-54) *Instrumentation:* Demographic and health survey, *Care and Needs Scale, Resident Choice Scale, Community Integration Questionnaire-Revised, and the Personal Wellbeing Index. Procedures:* Semi-structured interviews with residents and support workers pre-move and at 3 and 12 months post-move. Published measures administered pre-move and at 6-monthly intervals to 18-months post move.

Results: Six major themes emerged: “*It's all good*”, “*Overcoming challenges*”, “*Attendant care support*”, “*Making plans*”, “*Increased independence*” and “*Complexity*”. Increased opportunities for choice and greater levels of independence and participation in personal and household domains were recorded post-move. Indicators of satisfaction with life as a whole, health and achievements increased across time, corroborating the interview themes “it's all good” and “increased independence”. However, results were mixed for social and community inclusion, suggesting a strengthened focus on this area is indicated.

Conclusions: The study represents a step in addressing the current gap in understanding experiences of people with disability transitioning from supported settings to more independent living. Overall, results indicated improvements for this small cohort; however, transition was not without challenge and complexity. Implications for practice will be discussed.

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Determining the cost of living in the community after catastrophic brain injury in Victoria, Australia

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Background and aims: Following a severe acquired brain injury (ABI), adults require both paid and gratuitous care to live in the community, and significant resources are invested in environmental adaptations, equipment as well as attendant care. The aim of this study was to determine the cost and configuration of attendant care in Victoria for adults with severe acquired brain injury.

Method: Health economic evaluation using a cross-sectional design. Adults who had sustained a catastrophic ABI from all causes that necessitated continual (24 hours per day) care/supervision at the time of their discharge from hospital were recruited. N=40 people were interviewed and assessed for functional ability. Assessment of costs included recall of care hours and tasks, environmental adaptations and health economic projections.

Results: On average, the total sample was estimated to receive attendant care valued at a mean annual cost of \$208,399 p.a. (median \$163,025 p.a.) inclusive of both paid and gratuitous care. Those who had been living with an ABI longer had a higher mean annual cost and a more stable estimate of care than those recently discharged. Those with compensation reported a higher mean annual cost than the non-compensable group inclusive of paid and gratuitous care. Environmental adaptations did not result in cost savings in attendant care (paid+gratuitous) in this sample. This study did not, however, differentiate care need from the amount of care provided, and estimates should be taken as care provided.

Conclusion: The results of this study provoke important questions about the relationship between access to compensation and the amount of informal assistance provided and whether the amount of care that people receive is reflective of actual care needs.

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Revisiting the relationship between aphasia and cognition following severe TBI

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Background and aims: Aphasia remains a significant communication impairment for some people following Traumatic Brain Injury (TBI), particularly during the early stages of recovery. Recent research has focused on the social and cognitive communication impairments of TBI with little research into aphasia. Aphasia is a highly disabling impairment with negative effects on relationships, emotional wellbeing, work or school and even rehabilitation progress. We now understand that language and cognition are highly integrated processes yet there is little understanding of how aphasia and cognitive impairments overlap in the case of TBI. The primary aim of this study is to describe the relationship

between cognition and the presence of aphasia following severe TBI.

Method: Forty-seven participants with severe TBI from an inception cohort study were evaluated at approximately three months post-injury. Measures used were the Western Aphasia Battery – Revised (WAB-R) and a screening Cognitive Battery; converted to Z scores; comprised of the following: Digit Span; Symbol Digit Modalities Test; Hopkins Verbal Learning Test – Revised (HVLT-R), Brief Visuospatial Memory Test – Revised (BVM-T-R) and the Executive Function module from the Neuropsychological Assessment Battery (NAB). Descriptive and correlational statistics were used to describe the data.

Results: Fifty-two percent of participants (n=24) were diagnosed with mild anomic aphasia based upon the Aphasia Quotient of the WAB-R at three months post-injury. Participants with aphasia had a mean cognitive index Z score of -1.47 whereas the group without aphasia had a mean cognitive index Z score of -0.72. The largest differences between participants with aphasia and without aphasia were on the following subtests: Written and Oral Symbol Digit Modalities Tests, the Hopkins Verbal Learning Test-Revised, the Brief Visuospatial Memory Test-Revised and the Mazes and Judgements subtests from the NAB.

Conclusions: Mild anomic aphasia is highly prevalent in the first few months post TBI. Several different underlying cognitive profiles were identified. For example, for some participants; the aphasia diagnosis was influenced by subtle cognitive impairments across all subtests whereas other participants had distinct naming and/or discourse deficits. This study has identified some interesting links between aphasia and cognitive deficits following TBI. The relationship will be discussed further with potential clinical and research implications.

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Speech pathology approach to the assessment of cognitive communication skills after TBI: Do we all do it the same way?

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Background and aims: Little information is available on the assessment practices of speech language pathologists (SLPs) working with adults who have a cognitive communication disorder after a traumatic brain injury. This study aims to identify the tools used in clinical practice and whether evidence based practice is applied for this clinical group.

Method: An online survey was distributed internationally to SLPs working in English speaking countries. SLPs were asked what tools they use in clinical practice which they felt identified strengths and weaknesses in a person's communication skills as well as assisted in goal setting and intervention planning.

Results: Two hundred and sixty five SLPs responded. While functional communication was routinely assessed by the majority of SLPs (78.8%), clinicians predominately used aphasia and cognitive communication /high level language tools. The tests reported lacked valid and reliable psychometric properties to be used with the TBI population. Some differences in assessment practices were noted between countries (p<.001) and the SLP's setting of care (p=.01).

Conclusions: Assessment tools evaluating skills at the word and sentence level were utilized despite the evidence against this approach. Clinical implications regarding the clinical utility, validity and reliability of these tests will be discussed. Reasons why there were differences between countries and the setting of care will also be raised.

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A video analysis of the use of the 'concussion interchange rule' during the first year of implementation in the National Rugby League

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Background and Aims: Concussions are common in professional full contact sports. The aim of this study was to conduct a video analysis of the use of the 'concussion interchange rule' during the first season of its implementation in the National Rugby League (NRL) and to describe player and injury characteristics, situational factors, and time to return to play.

Method: Video analysis of 167 events where the concussion interchange rule was used during the 2014 NRL season.

Results: The incidence was 24.03 uses of the concussion interchange rule per 1,000 player NRL match hours or approximately one concussion interchange every 2.41 games. Forwards (69.9%) used the concussion interchange rule significantly more often than backs (30.1%) ($X^2(1, N=5226) = 31.03, p < .001$). Most incidences occurred from a hit up (62.3%) and most incidences occurred during a high tackle (80%). Only 7 (4.4%) of the striking players were injured. Nearly all uses of the rule involved a blow to the head or face (98.8%, 160/162). Loss of consciousness was observed in 30.2% of cases. Common observable signs of injury included clutching of the head (69.1%), body going limp (50.0%), wobbly legs (52.5%), and a blank or vacant state (59.9%). Post-concussive seizures were observed in 1.9%. There were 56.8% of players who used the concussion interchange rule and returned to play later in the same match. Of the players who were removed from play, the large majority returned the following week.

Conclusions: Concussions are common in the NRL and may occur due to a variety of circumstances. Towards the end of the season the NRL installed sideline video recording of all injuries for review by the medical staff. This initiative will facilitate immediate review of the common observable signs of concussion examined in this video analysis.

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Positive risk taking - Transition from a risk adverse rehabilitation setting to the risk filled community.

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Background and aims: Following a severe acquired brain injury (ABI), people experience cognitive deficits, emotional changes, lack of psycho-social support and physical deficits. Such impairments affect safety, judgement and risk after ABI. Clinicians structure support in the controlled inpatient rehabilitation environment, however acknowledge that people with ABI face safety challenges once discharged. The aim of this study was to implement positive risk taking (i.e. identifying potential risks to develop courses of action to balance these risks with potential benefits) and use behavioural experiments (i.e. reduced structure, supervision and support) in the rehabilitation setting.

Method: Case series design. The authors reviewed the use of behavioural experiments (eg. route finding, day planning and self-initiation of routine) to build insight and highlight risks. The impact of positive risk taking in building insight into functional and cognitive capacity and individual safety following brain injury was examined at an individual level. Organisational policies and procedures were also explored to examine their impact on positive risk taking within the inpatient setting.

Results: Positive risk taking within the inpatient rehabilitation setting improved safety outcomes for individuals and reduced levels of support required post-discharge. Behavioural experiments increased the accuracy of assessing individual strengths and weaknesses, reduced carer burden, developed insight and promoted independence. This enabled the development and implementation of compensatory strategies prior to discharge.

Conclusion: Positive risk taking for people with an ABI appears to be important in the inpatient rehabilitation setting. Further empirical studies are required to determine the benefits of positive risk taking and establish clinical guidelines to implement behavioural experiments systematically across rehabilitation settings.

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Use of Cognitive Screening Tests by Allied Health Therapists in ABI Rehabilitation

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Background and Aims: Cognitive screening tests (CST) are often used by allied health therapists in acquired brain injury (ABI) settings to aid clinical decision-making and management. Neuropsychologists need to be mindful of the CST used as colleagues report on cognitive domains when providing feedback to patients. Therapist awareness of the test limitations has not been established. The aim of this study was to identify the CST routinely administered by allied health in an ABI rehabilitation service and provide guidance about test selection and interpretation.

Method: A survey of allied health therapists was conducted at Epworth Rehabilitation to identify the CST in use, intended purpose of the tests, their perceived advantages and limitations, and how the obtained information is applied with ABI patients.

Results: Respondents consisted of Occupational Therapists and Speech Pathologists (n=10) who reported using at least one of seven CST. The primary advantage of these tests was considered to be brevity and ease of administration. Disadvantages identified by the majority of survey respondents (70%) included lack of meaningful information for moderate to severe ABI and lack of sensitivity to cognitive changes. Survey respondents reported using information derived from the tests to identify cognitive strengths/weaknesses, guide further assessment and intervention, and provide feedback to the team, patient and family.

Conclusions: The survey demonstrated the significant need to promote awareness regarding the careful selection and

consideration of cognitive screening tests. A focus group was subsequently held with allied health therapists to promote discussion of CST, highlighting specific limitations of CST most commonly used by colleagues surveyed. While these tests can provide an overall indication of cognitive functioning and are useful in identifying the need for more comprehensive assessment, they are not diagnostic and need to be interpreted conservatively for ABI patients.

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A case presentation – Collaborative knowledge usage enabling successful community access in an individual with severe challenging behaviour

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Background and aims: After traumatic brain injury many people display challenging and complex behaviours that limit their ability to engage in meaningful community activities. It is often seen as the role of a clinical psychologist to “fix” the problem. Lifetime Care and Support conducted an appreciative enquiry. It concluded that capacity building to enhance behaviour support needs to exist beyond Psychology. The aim of this presentation is to illustrate a collaborative approach between Psychology, Psychiatry, Occupational Therapy, support workers and the individual with a TBI.

Method: Psychology and Occupational Therapy identified a client with severe challenging behaviour (episodic dyscontrol), to utilise a collaborative approach to support his community living. His goal was to increase his ability to participate in leisure activities within the community, which were previously severely limited due to unpredictable physical and verbal aggression towards other members of the community.

A mixed method approach was used which included positive behaviour support, education with support workers and individual, modelling, collaborative strategy development, goal setting, active engagement approaches (Marcum, 2014), flexible approach with realistic expectations, graded exposure to challenging environments, and strong communication between the treating team, the person with TBI and his wider circle of support.

Results: The individual is now attending a community art group weekly, actively engaged in grocery shopping and participating in community leisure activities 6 day/week without physical aggression and significantly reduced verbal aggression. Successful capacity building has occurred within his wider circle of support.

Conclusions: This case presentation outlines the dramatic outcomes achieved by this individual as a result of a collaborative approach to behaviour support. This case study demonstrates effective capacity building to enhance behaviour support in a person with TBI.

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Attenuated melatonin production and sleep dysfunction following traumatic brain injury

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Background and aims: Over 50% of patients with traumatic brain injury (TBI) exhibit sleep disturbances at some stage

following injury. Possible causes of these sleep disturbances include increased depression and anxiety symptomatology, as well as neuronal injury to the brain regions involved in sleep-wake regulation. More recently, reduced melatonin production has been suggested as another potential mechanism.

Melatonin, a hormone produced by the pineal gland at night, is intricately involved in the regulating sleep. The aim of the present study was to examine whether outpatients with TBI display suppressed melatonin profiles.

Method: We conducted an overnight observational study to measure the overnight melatonin profiles in patients with TBI. The sample comprised of 10 patients with TBI who reported sleeping difficulties and these patients were compared to 10 age- and gender-matched healthy controls. Salivary melatonin samples were collected hourly, starting 6 hours before habitual bed-time until 2 hours after habitual wake-time.

Results: As anticipated, patients with TBI reported poorer sleep quality and increased daytime sleepiness. Patients with TBI also displayed reduced evening melatonin production, with melatonin production remaining attenuated throughout the night.

Conclusions: The current results suggest that impaired melatonin synthesis may underpin sleep disturbance in patients with TBI. Future studies should investigate whether melatonin supplementation can alleviate sleep disturbance in patients with TBI.

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Predicting functional outcomes after acquired brain injury: The role of emotional intelligence

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Background and aims: Individuals with acquired brain injury (ABI) are at risk of poor functional outcomes, including reduced community integration and mood disturbance.

Cognitive tests used routinely in neuropsychological assessment have limited utility in identifying patients at risk of these poor outcomes. A test of emotional intelligence (EQ) may provide additional predictive power by assessing skills that are proposed to underlie adaptive social and community functioning. The aims of this study are to (a) investigate whether EQ provides a useful assessment of emotional and social functioning after ABI, and (b) determine whether EQ is associated with altered community integration and mood following ABI.

Method: Participants were recruited from the ABI Outpatient Clinic at the Royal Talbot Rehabilitation Centre (n=55 at Jan 2015, recruitment ongoing). Participants completed the Mayer-Salovey-Caruso Emotional Intelligence Test, Community Integration Questionnaire, Hospital Anxiety and Depression Scale, and Wechsler Adult Intelligence Scale subtests. Average time since brain injury was 1.2 years (SD = 1.7).

Results: Preliminary findings have indicated that, despite average IQ, ABI patients exhibit below average EQ. One dimension of EQ, the ability to manage emotions, was associated with lower community integration. Cognitive measures, including IQ and working memory, were not related to community integration. Depression and anxiety symptoms were not associated with IQ or EQ, but were related to community integration.

Conclusions: These findings suggest that aspects of EQ, in particular the ability to strategically manage and regulate emotions, may be sensitive to poor functional outcomes after ABI. A test of EQ may provide a useful complementary method of assessment for this population. Further research is

needed to fully characterise the impact of emotional and social difficulties for people living with ABI.

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The impact of mild traumatic brain injury in predicting recovery following trauma in older adults: Acute outcome.

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Background and objectives: In the ageing Australian population, traumatic injury is an increasing issue for health service delivery. The propensity for mild traumatic brain injury (mTBI) within this population is high. Whether mTBI in the context of traumatic injury is associated with poorer outcome is yet to be investigated. The aims of this study were to identify variables (socio-demographic, prior health status, injury type, presence of mTBI) that predict early outcome in older adults with mild-moderate traumatic injuries.

Method: A de-identified retrospective sample of older adults with mild-moderate traumatic injury (\pm mild TBI) who were admitted to the Alfred Hospital, Melbourne, over a 5 year period (01/01/2008 - 31/12/2013), was examined.

Results: Preliminary analyses ($n = 4725$) demonstrated that within this cohort (M age = 79 years, range 65-104) the vast majority of admissions (62.5%) resulted from low level falls at home (43.4%). Unsurprisingly, admission length was moderately predicted by pre-injury health status but there was only a small contribution from socio-demographic and injury related variables. The most common discharge destination was rehabilitation/extended stay facility (43.8%), with increasing age and poor pre-injury health associated with this outcome. The presence of mTBI in the context of mild-moderate traumatic injury was not strongly predictive of discharge destination.

Conclusions: Brain injury is relatively common following mild traumatic injury in older age. However, in relation to early indices of recovery, although the presence of mTBI contributed to outcome, it was not as strongly predictive as increasing age, poor prior health and overall severity of injury.

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Do positive emotions influence recovery after chronic subdural haematoma?

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Background/Aims: Chronic subdural haematoma is one of the most common neurosurgical conditions with an estimated annual incidence rates varying from 1 to 13.1 per 100,000. Despite its relatively common presentation, information on health outcomes beyond the main neurosurgical variables of mortality and recurrence are limited. The aim of this study was to conduct a long-term follow-up of individuals from 2-10 years post-CSDH using a positive health framework (Seligman, 2008; 2013) that examined functional, biological and subjective well-being variables. It was hypothesized that

CSDH survivors with higher levels of positive emotions (flourishing) would experience improved functional, biological and subjective well-being outcomes.

Methods: N=91 community dwelling individuals with a previous admission to The Townsville Hospital for a chronic subdural haematoma participated in the study. They were administered a structured interview via phone that included: a demographics and medical questionnaire, the Functional Analysis Questionnaire-Self Report (FAQ-SR); The Cognitive Telephone Screening Instrument (COGTEL); the Mental Health Continuum-Short Form (MHC-SF); and the Geriatric Depression Scale – Short-Form (GDS-SF).

Results: A series of one-way between-groups ANOVA with post-hoc comparisons indicated a consistent pattern of significant differences between groups based on their levels of positive emotions. Individuals who were classified as flourishing experienced improved functional outcomes, higher levels of cognitive functioning, higher levels of emotional, social and psychological well-being, and lower levels of psychological distress (depression). Flourishing individuals were significantly higher than individuals classified as moderately mentally healthy. Additionally, individuals who were classified as languishing performed worse on all outcome measures.

Conclusion: The use of a positive health framework enables a consideration of outcomes beyond a traditional illness perspective. It highlights the significance of health assets such as positive emotions, and their importance in improving recovery after neurological injury.

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Comparison of the Production of Formulaic Language by Adults with Traumatic Brain Injury (TBI) and Healthy Controls

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Background and aims: Views on language processing have evolved from being solely focussed on newly created, novel sentences, to recognising the substantial role that “prefabricated” formulaic expressions have in conversational dialogue. Neuro-linguistic studies have concluded that a dual process model of language processing exists, whereby novel and formulaic expressions are processed by distinct cerebral structures. The aim of this study was to systematically evaluate the proportion of formulaic language used by adults with severe TBI and to compare this usage with that of healthy matched control participants.

Method: Participants were 15 adults with TBI and 15 gender, age and education matched controls. Language samples were analysed using established formulaic language analysis techniques. Proportions of total formulaic language produced and proportions across seven formulaic language subcategories were calculated and compared.

Results: Participants with TBI and control participants were observed to use similar total proportions of formulaic language and no significant difference was detected ($U = 109.50, p = 0.901$). Participants with TBI showed some difference in their use of formulaic language compared to controls in two subcategories. The difference in the proportions of formulaic distortion errors produced by the two groups reached statistical significance ($U = 75.00, p = 0.017$) and the difference in the proportions of expletives produced approached significance ($U = 90.00, p = 0.073$).

Conclusions: These findings are not consistent with the neural substrates that are proposed to underlie formulaic language production in the dual process model. In line with

this model, individuals with TBI would be expected to have a deficit in their overall production of formulaic language. However, this was not observed, as the TBI and control participants in this study produced the same proportions of formulaic language.

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The Awareness of Social Inference Test (TASIT) – A shortened version

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Background and aims: The Awareness of Social Inference Test (TASIT) is an ecologically valid and reliable tool that assesses higher-level social perception deficits. While Part 1 assesses emotion recognition, Parts 2 and 3 assess the ability to detect literal (sincerity and lies) and non-literal (sarcasm) conversational remarks, as well as the ability to make judgments about the thoughts, intentions and feelings of speakers. The measure is sensitive to the detection of deficits in various patient groups including traumatic brain injury, schizophrenia, frontotemporal dementia, Alzheimer’s disease, and stroke. Despite its clinical relevance as a tool to assess higher-order social cognition impairments in these populations, its administration time is lengthy (60-75 mins). As such, routine use of this tool in clinical settings is often difficult to achieve. The aim of this study is to develop a shortened version of the TASIT.

Method: Participants included 162 individuals (159 males, 46 females) with moderate-to-severe acquired brain injury. Data were applied to the Rasch model using WINSTEPS and Confirmatory Factor Analysis (CFA) using AMOS.

Results: The resulting shortened TASIT measure with an estimated administration time of 20 to 30 minutes, demonstrated acceptable goodness-of-fit and explained an acceptable amount of total variance (>50%) in each subscale. Construct validity of the new measure was confirmed by high correlations with the original version of the TASIT, moderate correlations with alternative social cognition measures, and small-to-moderate correlations with most alternative cognitive tests.

Conclusions: The shortened TASIT is a promising screening tool for higher-order social cognition deficits in those with acquired brain injury which can easily be administered in clinical settings.

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Validating the computerised Austin Maze task in a Traumatic Brain Injury sample

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Background and aims: An important aspect of cognitive functioning that is often impaired in people who have sustained a traumatic brain injury (TBI) is visuospatial learning and memory. A measure of visuospatial learning that has a long history in both clinical neuropsychological practice and research, especially in individuals with TBI, is the Austin Maze task (Bray & McDonald, 2010). However, this task has not been validated in a clinical population. The aim of this study was to assess the validity of the new computerised version of the Austin Maze task in TBI individuals.

Method: Participants included 28 individuals with moderate-to-severe TBI and 28 demographically matched healthy controls. Participants completed the Austin maze task together with alternative neuropsychological measures including the WAIS-III Digit Symbol and Digit Span subtests, the Trail Making Test, WMS-III Logical Memory, and Rey Osterrieth Complex Figure Test.

Results: TBI individuals performed significantly more poorly on the Austin Maze task than control participants. The Austin Maze task also demonstrated good convergent and divergent validity with the alternative neuropsychological measures.

Thus, the computerised version of the Austin Maze appears to be a sensitive measure that can detect visuospatial learning impairments in individuals with moderate-to-severe TBI.

Conclusions: The new computerised version Austin Maze task is a valid tool to assess visuospatial learning in those with acquired brain injury, which is also more accessible and easier to administer than the conventional form of the test.

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Factors of self-awareness related to full time employment for the clients with cognitive dysfunctions

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Background and aims: The purpose of this study was to examine factors of self-awareness relevant to full time employment for clients with cognitive dysfunctions.

Method: Twenty three trainees at vocational rehabilitation center participated in the study. We evaluate their self-awareness using Self-Regulation Skills Interview (SRSI) and Patient Competency Rating Scale (PCRS), and employment status (Full time or Not) at the end of rehabilitation.

Additionally their demographic data (age, gender, education, length from the onset) and full IQ were collected from their chart with informed consent. Discriminant function analysis and qualitative analysis (extraction of key words from SRSI, categorization, coding) were conducted to investigate the factors related to full time employment.

Results: Discriminant function analysis indicated that 95.7 % of original cases were classified (Wilks' Lambda was .279, $\chi^2 = 20.43$ (10), $p < .05$ and canonical correlation was .849), and strategy generation (-2.154) and age (1.426) were influential variables to determine the full time employment. Taking memos and using manual with reforming by themselves were central in external compensatory strategy and confirmation, emotional control and preparation were mainly coded in internal compensatory strategy for full time employment.

Conclusion: Cultivating of internal and external compensatory strategies is important for clients with cognitive dysfunctions for full time employment.

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Affective Theory of Mind and impaired Self-Awareness in acquired prefrontal cortex injury.

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Background; the prefrontal cortex (PFC) has been recognized as is a key area for the 'social brain'. Literature shows that damage to the medial-PFC (mPFC) has been consistently implicated in impairment of Theory of Mind (ToM). Literature states that impaired ToM reasoning, the inability to infer or reflect on emotional mental states, such as beliefs,

desires, and intentions to oneself and others is therefore strongly related to impaired self-awareness. Self-awareness can be defined as a the reduced capacity to reflect upon one's own cognitive and social-emotional disabilities. This study examined the relationship between affective-ToM-abilities and Self-Awareness in a chronic prefrontal lobe damaged outpatients group. We hypothesize that, with the critical role of the mPFC in both affective-ToM and self-awareness, impaired performances on affective ToM, strongly correlates with impaired self-awareness. Our final aim of this study is to investigate whether executive functions might be associated with deficits on ToM and self-awareness.

Methods: we studied 16 mPFC damaged patients with different etiologies (75% TBI) who entered the mental health institute for brain injury, Vesalius (sub-department of mental health institute Altrecht, The Netherlands). All patients completed a neuropsychological battery, the Awareness Questionnaire (AQ), Faux Pas, The RMET and the Frontal Systems Behavioral Scale (FrSBe). All patients had undergone a MRI to ferity or exclude brain damage. We divided patients in a mPFC damaged group and a non-damaged group (N = 16). All patients, including controls, were referred to this institute because of neuropsychiatric, social, and/or neuropsychological difficulties, which are expected to be a consequence of acquired brain injury.

Results: Both groups did not differ on demographics, education and sex. No correlation was found between affective-ToM and the subscales of the AQ and FrSBe. The prefrontal lobe group preformed significantly worse compared to controls on the empathy question of the Faux Pas ($t = 2.8$, $p = .008$) and RMET ($t = 2.10$, $P = .044$). A significant difference was found for the recall of the RAVLT ($t = 2.1$, $p = .044$) and the Categories Completed of the WCST ($t = 2.71$, $p = .013$). A significant negative correlation was found between the detection of a Faux Pas and the WCST subscale PE (Perseverative Errors) ($r = -.059$). Empathy correlated both significantly with the subscale CC (categories achieved) of the WCST ($r = 0.59$) and letter fluency ($r = 0.58$). We found no correlations between Self-Awareness deficits and neuropsychological measures.

Conclusions; although ToM and Self-Awareness share the same mPFC networks, the distinction made between "cognitive" and "affective" ToM, might explain some results found. Patients in the mPFC group might have learned to use cognitive compensatory strategies over time to improve metacognitive abilities for better self-awareness and cognitive-ToM skills, despite the low score on affective-ToM. Besides, the low discrepancy scores on self-awareness, subtracting family ratings from the patients' self-ratings, might reflect the adaptation / coping of the family. Future studies on affective-ToM and self-awareness should determine the cognitive mechanisms of the mPFC.

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Visual and ocular processing deficits following traumatic brain injury: A systematic review

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Background and aims: Several visual and ocular processing deficits have been found to occur as a result of traumatic brain injury (TBI). The aim of this study was to conduct a systematic review to describe the range and frequency of vision-related deficits that have been reported in this population.

Method: A systematic search of the literature published between 1 January 2003 and 30 April 2014 was completed using MEDLINE, EMBASE and CINAHL. The review was limited to non-blast injuries in the adult population. No limitations were placed on injury severity, time post-injury or

study design. Additional records were obtained via hand-searching of reference lists. The search yielded a total of 2571 records. Following removal of duplicates and screening for eligibility, 64 articles were retained for inclusion in the review. The majority of these articles (n=39) were case reports.

Results: Twenty-four visual and ocular processing deficits were identified. Areas affected included: vision, visual fields, pupillary responses, eye movement control, depth perception and impaired ocular alignment causing diplopia. Difficulty with focussing on near tasks was also reported.

Conclusions: This review is the first to highlight the wide range of visual problems that occur as a result of TBI. The diffuse nature of the injury impacts visual function in multiple ways throughout the visual system and can have consequences across a range of daily activities.

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Are social skills impairments on the radar? Assessment practices of clinicians working in brain injury

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Background and Objectives: This study aimed to survey clinicians working with people with acquired brain injury (ABI) to determine clinical assessment practices of social skills and behaviour in this population.

Methods: The survey was distributed to clinicians via professional networks, using online survey methodology (SurveyMonkey). Clinicians were asked to estimate the frequency in which they observe social skills impairments in their clients with ABI. Clinicians were also asked to estimate the frequency in which they assess social skills, the tools that they use for the assessment of social skills, perceived obstacles to the assessment of social skills in this population, and the frequency in which they engage in social skills rehabilitation.

Results: Despite 40% of the 443 respondents reporting that greater than 50% of their clients with ABI report social skills impairments, 68% of these clinicians reported that they infrequently or never assess social skills using a formal assessment tool. Availability of reliable tests and inadequate training in social skills assessment were just two of the obstacles to assessment that were identified by clinicians.

Conclusions: Results of this survey highlight a problematic discrepancy between the prevalence of clients with ABI reporting social skills impairments, and the assessment practices of clinicians working in this area. The barriers to assessment and provision of rehabilitation in the area of social skills will be discussed further, in addition to what can be done by clinicians and researchers to close the gap between evidence and practice in the area of social skills assessment after brain injury.

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Defining 'Psychosocial in Brain Injury' – A critical appraisal of professional approaches

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Background and Aims: There is limited understanding of the different professional standpoints to defining and addressing the concept psychosocial in community brain injury rehabilitation. The aim of this paper is to identify how psychosocial in brain injury is defined by different professions and clinically practiced across these disciplines.

Method: A critical appraisal of the literature was undertaken to review the concept of psychosocial in this sector and identify the professions undertaking work in this area.

Relevant electronic databases including CINAHL, Medline, PsycBITE, PsycINFO and Scopus were searched utilising inclusion criteria including recently published works, studies post-hospitalisation and utilising key terms ie. psychosocial, brain injury, neurological rehabilitation and community. Relevant papers meeting criteria were identified, assessed and reviewed for inclusion in the paper.

Results: The appraisal indicates the influence of professional frameworks on how the concept psychosocial is interpreted and practiced. There are noted similarities and differences between professions in the emphasis placed on different dimensions of psychosocial. Notably, psychology and occupational therapy are dominant in the literature, while other professions such as social work are less apparent. Based on this appraisal, research that investigates professional standpoints on the psychosocial and anticipated outcomes for individuals is warranted.

Conclusions: Psychosocial is a multifaceted concept. Any variability in the way it is defined and then practiced has the potential to impact on individual outcomes. To gain more clarity, understanding and knowledge of differing professions understanding of this concept in this space and how this defines clinical work, will enable improved rehabilitation practices and improved outcomes for individuals to be achieved.

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Mapping lifespace as a tool to enhance narratives: Understanding the needs, outcomes and experiences of family members during driving disruption following a brain injury.

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Background and aims: Family members of a person with an acquired brain injury (ABI) often provide transport assistance during driving disruption with potential impacts on their own travel and participation within the community, also known as lifespace. Lifespace is a measure of geographical travel and is associated with activity engagement, well-being and quality of life. This study aimed to explore lifespace as a therapeutic interviewing tool to enhance narratives and understand the lived experiences of family members during driving disruption following ABI.

Method: In-depth semi-structured interviews were conducted with 15 family members (at recruitment, 3 months and 6 months). Exploration of lifespace was embedded within the interviews when participants were asked to describe their travel patterns using Google maps. The created maps, related narratives and reflections were analysed within a phenomenological framework to understand the changing lifespace and implications.

Results: Family members (9 females, 6 males) were aged 28 to 68, and were caring for their spouse (n=11) or their adult child (n=4). The created maps indicated an increased lifespace for half of the participants, reflecting the need to provide

transport. Others demonstrated a decreased lifespan reflecting surrendered roles (e.g. paid employment and leisure activities) or reduced access to transport. Participants reflected on the emotional and practical aspects of their changing lifespan.

Conclusions: Lifespace is a useful new concept to explore travel patterns and the use of maps was an effective tool for understanding the impact of driving disruption on family members' participation and emotions arising from lifestyle changes. Maps can serve as visual representation that facilitates the narration of a person's lived experience by highlighting activities of importance.

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Beyond just neglect: Preliminary evidence of retrospective time estimation abnormalities in non-neglect stroke and TIA patients Low, Essie¹; Wijeratne, Tissa^{2,3}; Perre, Diana^{2,4}; Ong, Ben¹; Laycock, Robin¹; Tu, Hans^{2,3} and Crewther, Sheila¹

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Background and aims: The perception of the passage of time is crucial for one to navigate through everyday activities not just in space but in time. Findings from seven studies in the current literature tended to demonstrate a gross underestimation of time interval in right-hemisphere damaged neglect patients (N) compared to controls, while no significant differences have been demonstrated in non-neglect right- (R) and left- (L) hemisphere damaged patients. Time estimation following a transient ischemic attack (TIA) is unknown given a paucity of research. This study aimed to investigate time estimation for performance of a visual task in R, L, N and TIA groups. Estimation is considered to be retrospective, whereby participants estimated time elapsed during the task, without prior prompting.

Method: 12 L, 16 R, 3 N and 10 TIA patients provided an estimation of the duration of a visual 0-back task (75s in length), following completion of the task. Results were compared to that of 30 control subjects who were matched by age and education.

Results: One-way ANOVA revealed a significant difference in mean time estimation for groups, $F(4,27) = 39.24, p < .001$. Further planned contrast comparisons between each clinical group and controls revealed that the duration of task was significantly underestimated in L ($M=46.25$, Cohen's $d = -1.00$), R ($M= 57.85, d = -0.70$), N ($M=7.33, d = -1.93$) and TIA ($M=45.50, d = -1.01$) groups, compared to controls ($M=87.83$).

Conclusions: This study provides preliminary evidence of perceptual time underestimation, not just in neglect patients, but also in non-neglect patients with a unilateral brain damage, and in TIA patients. Characterisation of time estimation may prove useful in clinical settings and may help to inform rehabilitation to return to independence of functional skills in everyday settings.

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The development and implementation of a preliminary taxonomy of case management in brain injury (BICM-PT) Lukersmith, Sue^{1,3}; Croker, Dianne³; Salvador-Carulla, Luis^{1,2} on behalf of the CM nominal group

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Background and aim: Community-based case management (CM) makes a unique contribution towards the improved functioning and community participation of people with complex health conditions such as brain injury. CM necessarily involves independent, inter-dependent and multiple components, in different contexts. There is no international consensus on what is, and what is not CM. The aim was to develop a knowledge framework, the taxonomy for use by the Lifetime Care & Support Authority (LTCSA) as a common language with stakeholders, to support quality analysis and best practice.

Methods: The study used mixed qualitative research methods to develop the taxonomy (scoping, framing and nominal group). The Beta 1 was developed after scoping case management literature and critical review of international frameworks, followed by iterative development of the final BICM-PT using a nominal group technique with CM experts. The next phase involved identifying areas for application of the taxonomy in the LTCSA to enhance understanding and improve outcomes of case management practice for scheme participants.

Results: The BICM-PT is a multi-dimensional framework and considers factors related to the CM service domains and a taxonomy tree of key components (interventions or actions), and includes a consensus definition of CM and glossary of terms. The paper describes the LTCSA approach taken to implement the taxonomy in the short term and longer-term communication and business practice.

Conclusions: The taxonomy is a knowledge to practice tool. It provides a common language for CM practitioners, services and funding organisations relevant for monitoring, comparisons, business planning and quality assessment.

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Neurotoxic or neuroprotective? A meta-analysis examining the paradoxical effects of positive blood alcohol levels on outcomes after TBI

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Background and aims: Alcohol is a known risk factor for traumatic brain injury (TBI) although, paradoxically, positive blood alcohol levels have been shown to both promote and protect against secondary brain damage. Given these competing actions, it is currently unclear whether people who have positive blood alcohol levels (BAL⁺) at the time of their TBI have better or worse outcomes than those who have not consumed alcohol (BAL⁻). A meta-analysis was, therefore, undertaken to examine the nature and extent of any differences in outcomes for these two groups.

Method: The PubMed, PsycINFO, EMBASE, and Scopus data-bases were searched (inception to January 2015) for studies that compared the outcomes of BAL⁺ and BAL⁻ adults (≥ 16 years) following non-penetrating TBI. Potential studies were screened using detailed inclusion/exclusion criteria. Cohen's d effects sizes were calculated using a random-effects model and ninety-five percent confidence intervals computed to determine statistical significance.

Results: The cognitive (orientation, attention, memory, motor, perception, visuo-spatial, verbal, reasoning, executive functioning, general cognition) and functional (disability/independence, length of hospital/intensive-care stay, mortality) outcomes of BAL⁺ and BAL⁻ participants from 23 independent studies were compared. No study examined psychological outcomes. Most effect sizes were small and non-significant. However, there were small negative and significant effects for overall cognition (combined across all domains), reasoning, and global

measures of cognition, indicating that the BAL⁺ persons performed more poorly after their TBI.

Conclusions: Positive blood alcohol readings at the time of sustaining a TBI appear to have a limited impact on cognitive and functional outcomes, with the impact on psychological outcomes yet to be determined. The findings are discussed in terms of important moderator variables and potential caveats.

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Measuring reliable change in traumatic brain injury (TBI): The pitfalls of using readily available formulae

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Background and objectives: Individuals with a TBI frequently undergo repeat neuropsychological assessments for clinical and medico-legal purposes. Reliable change (RC) methodologies based on general population norms are often used to assess for clinically significant change. The consequence of applying such methodologies to people with TBI needs investigation. This pilot study tested the validity of readily available formulae in a TBI sample and developed a method specific to the TBI population.

Method: Participants (n=11) with severe to extremely severe TBI and >2 years post-injury were administered the WAIS/WMS-IV battery on two occasions with a 12 month interval. Index scores were entered into 10 RC formulae to assess their validity in this stable TBI sample. A formula based on the stable group (>2 years post-injury) was also generated and compared to the standard formulae. Finally the validity of this new formula was assessed in a recovering (N=13) TBI sample (<2 years post-injury).

Results: All available formulae over-identified “decline” in the stable TBI sample. Equations accounting for practice and regression to the mean performed most poorly, identifying “decline” in up to 54% of the sample. The developed TBI equation (based on Iverson, 2001) was the best performing formula finding “change” in only 9-18% in the stable group. This equation also showed promise for use in the recovering TBI sample.

Conclusion: Caution must be taken when selecting from readily available formulae to determine RC in the TBI population. Indiscriminate use of such formulae can lead to over identifying decline and under identifying clinically significant improvement.

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Reflecting on the Manager’s Commitment to Evidence-Based Practice- Developing a Model of Care based on clinical practice guidelines.

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Introduction: The establishment of a new rehabilitation service for people with severe acquired brain injuries necessitated the development of a model of care on which clinical practices could be based. This paper describes the development and implementation of an evidence-based model of care drawn from clinical guidelines.

Aims: To develop a Model of Care to guide everyday nursing, medical and allied health clinical care which will improve patient outcomes, lead to high patient and family satisfaction and maximise interdisciplinary practice.

Method: Preliminary development work was undertaken which included a needs analysis of Victorian inpatient rehabilitation opportunities for the clinical population; site visits to national and international services; qualitative research to determine who receives rehabilitation in Victoria and the patient and family perceptions of goal setting, rehabilitation outcomes and community integration; and a systematic review of the features inherent within a model of rehabilitation care. The model of care is thus based on evidence, and incorporates seven key strategies.

Results: This paper will demonstrate the process of developing a model of care consistent with best available research evidence and a needs analysis of the service and highlight the key role that management must play in directing evidence-based rehabilitation.

Conclusions: A model of rehabilitation care delivery was established and implemented. Primary barriers to optimal delivery of rehabilitation care will be discussed to ensure that other managers and services are able to use our findings to evaluate their own practices.

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Efficacy of Cognitive Behaviour Therapy in treating fatigue and sleep disturbance following acquired brain injury: a pilot randomized controlled trial

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Background and Objectives: Fatigue and sleep disturbance are highly prevalent following an acquired brain injury (ABI) yet there are limited evidence-based treatments available.

Cognitive Behavioural Therapy (CBT) is a well-established treatment for insomnia and chronic fatigue syndrome in the non-injured population but there is a paucity of controlled trials investigating this intervention in traumatic brain injury (TBI) and stroke cohorts. This pilot controlled trial aimed to evaluate the efficacy of an eight weekly CBT program in treating ABI-related fatigue and sleep disturbance.

Method: Participants with a history of TBI or stroke with clinically significant fatigue and/or sleep complaints were randomly allocated to the intervention group (n=7) or the waitlist for four months (n=3). All participants completed baseline measures of fatigue (Brief Fatigue Inventory, Fatigue Severity Scale), sleep (Pittsburgh Sleep Quality Index, Insomnia Severity Index, Epworth Sleepiness Scale) and mental health (Hospital Anxiety and Depression Scale). Outcomes were assessed at two and four months after randomization.

Results: Participants in the intervention group reported significantly improved fatigue at two months on the Brief Fatigue Inventory (p<.05) and in sleep on the Pittsburgh Sleep Quality Index at four months follow-up (p<.01). Depression was significantly reduced at both time-points for the intervention group (p<.05). The effect sizes for these differences were large between the groups.

Conclusions: Preliminary findings support the efficacy of CBT in treating fatigue and sleep disturbance as well as improving symptoms of depression for people with an ABI. Recruitment is ongoing and further data will be presented.

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The Relationship between Integrity of the Medial Forebrain Bundle and Attention and Working Memory following Traumatic Brain Injury

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Background and aims: Damage to white matter pathways following TBI has been found to be associated with impaired cognition. The medial forebrain bundle (MFB), in particular, is implicated in attention and working memory as it contains ascending catecholamine fibres that project to the prefrontal cortex (PFC). This study was the first to investigate the integrity of the white matter within the MFB and its association with performance on attention and working memory tasks following TBI.

Method: A sample of 14 controls and 17 participants with moderate-severe TBI (mean days PTA = 40.31, mean days since injury = 530.81) were included in the study. Whole brain DTI was acquired on a Siemens 3 Tesla Skyra scanner using a spin echo EPI sequence (64 noncollinear diffusion encoding directions, 2mm³ isotropic voxels, b = 5, 2000 s/mm²). Fractional anisotropy (FA) and mean diffusivity (MD) of the left and right MFB were calculated. Participants also underwent neuropsychological assessment.

Results: Both the left and right MFB were found to have significantly lower FA ($p < 0.001$) and higher MD ($p < 0.001$) values in participants with TBI when compared to controls. In addition, participants with TBI demonstrated significantly slowed speed of processing ($p < 0.001$), and made more executive errors ($p = 0.001$) when compared to controls. Significant correlations were found between DTI metrics and attention outcomes ($p < 0.05$)

Conclusion: This is the first study to demonstrate that the MFB is damaged in TBI and associated with attention outcomes, potentially mediated by changes to extracellular catecholamine levels in the PFC.

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Factors Associated with Post-traumatic Growth Following Traumatic Brain Injury

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Background and Aims: Post-traumatic growth (PTG) is the experience of positive psychological change emerging from a struggle with highly challenging life events. PTG has been associated with greater vitality, life satisfaction, optimism and general health and may act as a buffer for management of pain and distress. Understanding the factors associated with PTG would potentially assist clinicians to facilitate post-injury adjustment. The aim of this study is to determine the factors associated with PTG following moderate to severe TBI (as measured by PTA length).

Method: PTG was measured using Post-traumatic Growth Inventory Short Form (PTG-SF) and the Changes in Outlook Questionnaire Short Form (CIOQ-SF). Functional outcome was assessed using the Glasgow Outcome Scale Extended (GOSE) and psychopathology using the Structured Clinical Interview for DSM-IV-TR Axis I Disorders (SCID-IV) and Hospital Anxiety and Depression Scale (HADS). Value

consistent living was assessed by the Valued Living Questionnaire (VLQ). The sample (N = 50) included 49 males (M= 39.61yrs; SD=15.93) and 9 females (M = 42.22yrs; SD = 14.94) with an average of 12 years of education, who were assessed cross-sectionally 12 to 72 months following TBI.

Results: Time post-injury and injury severity showed no significant relationship with any variables. Higher education and younger age were positively associated with PTG. The presence of one or more psychiatric diagnosis did not affect the likelihood of PTG; however, some anxiety symptomatology was positively associated with PTG. Valued consistent living was also positively associated with PTG.

Conclusions: Based on these results, a predictive model for PTG following TBI will be formulated.

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Development of referral coordination for access to Victorian Acquired Brain Injury (ABI) Rehabilitation Service beds

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Background and aims: A new statewide ABI Rehabilitation Centre opened in Victoria at Caulfield Hospital in 2014, adding 42 new rehabilitation beds and associated community based services to the service system. This new service was developed to complement and expand the existing statewide public ABI rehabilitation services in Victoria. This project aimed to ensure that, given this increase in public bed capacity, that referrers were able to access the most appropriate rehabilitation bed for their patients in a coordinated, efficient manner. It also aimed to prevent duplication of effort by the specialist ABI services when screening and assessing referrals.

Method: Data was gathered from each of the ABI rehabilitation services about their current referral practices including clarification of target groups for each service. Suggestions were gathered about possible methods for improving coordination and streamlining referral and assessment processes. Workshops were held with key stakeholders – subacute rehabilitation assessors / bed access staff and another with representatives of acute hospital referrers. Various scenarios and options for referral coordination were developed and debated at these workshops which were then refined and presented to the Statewide ABI Rehabilitation Advisory Group.

Results: A common referral tool and communication processes were developed and implemented in 2014 for referrals to the two public statewide ABI rehabilitation services. Acute referrers now only need to complete one referral for consideration for admission to ABI rehabilitation beds at either Alfred Health or Austin Health ABI rehabilitation services. This referral tool was developed to be detailed enough that few patients would require face to face assessments by ABI rehabilitation service staff and would thus streamline access to rehabilitation.

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Group therapy interventions in traumatic brain injury rehabilitation: Clinicians perceptions of processes and effectiveness

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Background and aims: Group therapy interventions are commonly used in rehabilitation following brain injury. Literature identifies a number of advantages to the use of group therapy interventions in rehabilitation including cost-effectiveness, maximizing intensity of rehabilitation, and opportunities for peer support and learning. Currently there is limited research evidence available to guide therapists in the delivery of group therapy interventions to patients with traumatic brain injury (TBI).

The aims of this study were to explore the experiences and perspectives of clinicians about the benefits, limitations and processes of occupational therapy group-based interventions in an inpatient brain injury rehabilitation setting.

Method: A qualitative methodology was utilized with data collected from focus groups.

Occupational therapists (OT) from the Brain Injury Rehabilitation Service (BIRS) Team at a major metropolitan hospital, and OT students completing clinical placement in BIRS were invited to participate. Data were analyzed using framework analysis. Focus group transcripts were reviewed by the principal investigator and a second independent reviewer separately. A thematic framework was developed and discussed with a third independent reviewer. The framework was applied to data, and the data charted and mapped. Discussion with the research team enhanced the trustworthiness of the themes and categories.

Findings: Preliminary results indicate that the experiences of clinicians conducting groups with people with TBI centred around the categories of pre-group/planning processes, patient-centeredness, family, challenges, peer-to-peer interactions, and therapist skills.

Conclusions: Overall, clinicians reported that group therapy interventions contributed positively to the rehabilitation process for patients following TBI.

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A multidisciplinary team approach: Enabling a client to re-engage in meaningful leisure pursuits and productivity
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Background: The Community Rehabilitation Program (CRP) provides a holistic service aligned with the International Classification of Functioning, Disability and Health (ICF) framework to enable clients living with an Acquired Brain Injury to achieve meaningful outcomes. This presentation outlines the journey of a 17 year old male, Mr D who sustained a Diffuse Axonal Injury from a Motor Bike Accident and was able to successfully re-engage in work and leisure activities.

Aims: Mr D set rehabilitation goals related to participation and community integration which were used to guide the multidisciplinary therapy he received. Specifically he set goals of returning to work; managing his own routine independently; playing soccer with friends again; and improving the intelligibility of his speech for day to day communication.

Methods: Mr D received intensive therapy from the Physiotherapist, Occupational Therapist and Speech Pathologist for 12 weeks. Discipline specific outcome measures were completed at initial contact and upon discharge. Program outcome measures were collected pre and post including the World Health Organisation Quality of Life-BREF, Sydney Psychosocial Reintegration Scale and Community Integration Questionnaire.

Results: Mr D achieved 80% of the goals he set at the start of the program. He was able to return to work on a suitable duties program and was able to play a social game of soccer with his friends. A significant improvement was noted in his intelligibility at a conversation level when communicating with different partners. Mr D still requires assistance from his family with managing his routine however this improved over the course of the program.

Conclusions: Results from this case study demonstrate that the model of service delivery adopted by the Community Rehabilitation Program was successful in lowering this client's overall level of disability by enabling him to re-engage in meaningful leisure and productive activities despite his limitations.

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Early conversational recovery of people with severe Traumatic Brain Injury and their communication partners

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Background and aims: Conversational skills can be impaired following a severe Traumatic Brain Injury (TBI). However, little is known about early conversational recovery in people with severe TBI and how well communication partners (CPs) support their conversations. Therefore this study aims to investigate whether the degree of participation by people with TBI, and the degree of support from their communication partners (CPs) changes in conversation during early recovery.

Method: Seventeen pairs of participants with TBI and their CPs were video-recorded having a 10 minute casual conversation at 3 and 6 months post injury. Communication behaviours were rated by two trained raters using the adapted Measure of Participation in Conversation (MPC) and the adapted Measure of Support in Conversation (MSC). Ratings at both time points were compared.

Results: Inferential analyses revealed that there was no significant change in the degree of participation in conversation by participants with TBI and the degree of conversational support by their CPs from 3 to 6 months post injury. Comparison of qualitative field notes showed that some conversational behaviours did change over time but this was not necessarily reflected as a significant change in MPC/MS scores.

Conclusions: Documenting early communication recovery is critical, but a complex and challenging endeavour. The lack of change in conversational effectiveness on global conversational measures during the early stages of recovery highlights several underlying factors that can influence recovery and the measurement of recovery. These factors will be explored further in the presentation.

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A systematic scoping review of goal planning approaches and principles used in rehabilitation for people with acquired brain injury

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Background and aims: Goal planning is a central process that guides rehabilitation intervention for clients with an acquired brain injury (ABI). Despite its widespread use in clinical practice, there is limited research that systematically examines what constitutes effective goal planning. Overall there is a need to explore and develop approaches to goal planning for people with ABI to maximise engagement in

rehabilitation and outcomes. This review aimed to (1) identify goal planning approaches used for people with ABI in the working aged range and (2) extract goal planning practice principles from studies that evaluate goal planning approaches.

Method: Systematic scoping review of databases identified studies that described or evaluated goal planning approaches. Goal planning approaches were classified as informal or formal. Methodological quality appraisal was completed for all studies that evaluated a goal planning approach. Practice principles were extracted from evaluation studies using a content analytic approach to identify key themes.

Results: Formal goal planning approaches were used in 77 percent of studies. Key practice principles extracted commonly described goal planning in ABI as being client-centred, collaborative, measurable, realistic, motivational, metacognitive, and flexible, as incorporating proximal goals, education and experiential learning or as providing a link to therapy.

Conclusions: The use of formal goal planning approaches appear more prevalent in research studies, however surveys of clinicians indicate that informal goal planning approaches are commonly used in routine clinical practice. There is a strong theme in the literature that client-centredness and collaboration are necessary components of effective goal planning.

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Musical hallucinations following acquired brain injury Ramsden, Clare^{1,2}

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Background and Aims: This presentation aims to summarise the current literature on musical hallucinations following an acquired brain injury, present a case study of musical hallucinations in a musician following herpes simplex encephalitis and associated amnesic impairment, and discuss the implications for models of cognitive processing of music.

Methods: In a single case study, self-replication (via singing) of the musical hallucination was elicited and audio-recorded over three episodes, several weeks apart. The recordings were transcribed and analysed for similarity, and a family member was interviewed.

Results: The participant replicated the same tune when asked about their musical hallucination over the three episodes. The family member (also a musician) reported that the musical hallucination appeared to have been relatively unchanged for a period of 30 years.

Conclusions: Musical hallucinations have been proposed to be associated with ongoing stimulation of a specific neural circuit. In this case, the participant's hallucinations are hypothesized to arise from the activation of an acoustic memory circuit but without moderation from episodic memory due to his amnesic disorder, resulting in a consistent hallucination experienced across many years. The participant's musical hallucination is complex and suggests origins in the higher-order auditory areas, including the antero-lateral temporal or frontal lobes. This is consistent with areas of impairment identified by neuroimaging, and supports the literature regarding simple and complex musical hallucinations.

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Using videoconferencing to evaluate conversations between people with traumatic brain injury and their usual communication partners

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Background and aims: People with traumatic brain injury (TBI) have difficulty participating appropriately in conversations. Conversations may be further impeded by inadequate responses from communication partners (CP). The Adapted Kagan scales focus on measuring participation of the person with TBI (MPC scale) and support provided by the communication partner (MSC scale). In previous studies, these scales have shown high inter-rater and intra-rater reliability and have been sensitive to change as a result of intervention. In preparation for the trial of a telehealth adaptation of the communication skills program *TBI Express* (Togher et al., 2010) we studied inter-rater reliability of these scales comparing ratings of telehealth to in-person recordings.

Method: Participants with TBI were recorded talking with their usual CP about any topic for five minutes. Participants completed this task twice: once during a Skype videoconference and once during a home visit. Order of sessions was randomised. Two speech pathologists rated study samples independently using the Adapted Kagan scales. Inter-rater agreement on this scale for both Skype and in-person recordings were compared using intra-class correlations.

Results: 19 participants completed the study. Three Skype recordings were poor quality and unable to be rated. Inter-rater agreement was excellent for the MPC scale (ICC 0.83-0.90) for both Skype and in-person recordings. Inter-rater agreement for the MSC scale was good to excellent for Skype recordings (ICC 0.66-0.83) but fair to good for in-person recordings (ICC 0.49-0.60). There was no significant difference on the MPC or MSC scale between Skype and in-person recordings ($p > .05$).

Conclusions: Using videoconferencing to evaluate participation of people with TBI in conversations showed excellent inter-rater agreement, and was as reliable as using in-person recordings. Levels of inter-rater agreement were lower for measuring support provided by communication partners.

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A pilot study of the use of telehealth for social communication skills training for people with traumatic brain injury and their usual communication partners

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Background and aims: *TBI Express* (Togher et al., 2010) is a social communication skills program for people with traumatic brain injury (TBI) and their usual communication partners (CP) that has shown positive outcomes. However, many families are unable to access this program due to distance from brain injury services or other time commitments that make attending appointments difficult. Telehealth delivery could make this type of training more accessible. We explored the feasibility of delivering *TBI Express* in a telehealth format in a pilot study of two participants.

Method: The original content of *TBI Express* was modified so that all modules could be delivered: (1) via videoconference instead of in-person, (2) via individual sessions only instead of a combination of group and individual sessions, (3) 1.5 hours per module instead of 3.5 hours. The modified program was trialled with two participants with TBI and their usual CP.

Results: Both participants completed all modules successfully via telehealth using Skype. Both participants with TBI and their CP reported positive change on items on the La Trobe Communication Questionnaire (range: 15/30 to 24/30 items). Participants with TBI also reported positive change on the Communication Confidence Rating Scale for Aphasia (PRE: 580/1000, 685/1000; POST 860/1000, 800/1000) and the Quality of Life After Brain Injury Scale. Blinded ratings of conversation by independent assessors indicated improvement for both participants in participation in conversation.

Participants reported high levels of satisfaction with telehealth delivery in post-intervention qualitative interviews.

Conclusions: Telehealth delivery of social communication skills training appears feasible and effective. In the next phase of this research, a clinical trial will compare the outcomes of telehealth training with face-to-face training.

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A comparative study of carer burden and emotional distress experienced by family and formal caregivers after Traumatic Brain injury

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Background: The prevalence of carer burden, emotional distress and impact on health in caregivers of individuals with traumatic brain injury (TBI) has been found to be high. The majority of the literature considers carer burden in family caregivers with formal caregivers (i.e. paid carers) being predominately ignored. Also the preponderance of literature is based in community settings thus leading to a paucity of research of the experience of caregivers in inpatient settings.

Aim: To compare the frequency, extent and relationship of carer burden, emotional distress and general wellbeing in family and formal caregivers caring for TBI patients in an inpatient setting.

Method: Family and Formal Caregivers at an in-patient neurorehabilitation centre were asked to complete a number of standardised measures; Depression, Anxiety and Stress Scale (DASS), The General Health Questionnaire (GHQ) and the Burden Interview (BI). Demographic information for both groups was also gathered. To date 32 sets of data have been collected.

Results: Levels of carer burden was equally prevalent in both groups ($t(29)=1.83$ ns). In terms of emotional distress there was a significant difference between groups with respect to depression and stress ($t(29)=2.49$ $p<.05$ and $t(29)=2.43$ $p<.05$ respectively). Levels of anxiety was equally prevalent in both groups ($t(29)=.79$ ns). There was a significant difference between groups with respect to wellbeing ($t(29)=2.41$ $p<.05$).

Conclusions: This study is still continuing but the preliminary data analysis suggests the experience of family caregivers is mirrored in that of formal paid caregivers. Further participants are being recruited and further analysis is needed to consider whether there which factors such as length after injury, level of involvement, relationship to patient with TBI are most predictive of caregiver burden, emotional distress and reduced wellbeing.

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Effect of Modafinil on Level of Consciousness: A Pilot Study

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Background: There are several factors which are responsible for impaired levels of consciousness including the nature and

type of injury, infection and side effects of medication. Modafinil is best known as a sleep regulator for healthy individuals. Some studies, however, suggest that it can be used to improve consciousness in survivors of severe brain injury. We carried out a pilot study to look at this.

Aim: To evaluate the efficacy of modafinil on levels of consciousness in brain injured patients in the Vegetative State (VS) or the Minimally Conscious State (MCS).

Method: Eighteen survivors of brain injury, seven with a traumatic brain injury (TBI) and 11 with a non-traumatic brain injury (NTBI) mainly anoxia, were assessed with the Wessex Head Injury Matrix (WHIM) before and after administration of modafinil. Results were compared between TBI and NTBI patients and between those who were in a VS and those in a MCS. All patients received regular medical and therapeutic interventions.

Results: The scores of 55% of patients improved after the administration of modafinil in awakeness, awareness, alertness and concentration. Of those who showed improvement, 60% had a TBI and 40% a NTBI. In the recovery group 50% of patients had progressed from a VS to a MCS. A Chi Square Test showed no significant effects of modafinil.

Conclusion: Modafinil does not appear to enhance consciousness in brain injured patients although there might be a sub group of patients who do respond. Further work is needed to identify those most likely to benefit.

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Barriers and enablers to articulating occupational role performance after acquired brain injury

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Background and objectives: Evidence recommends the use of patient-directed goal setting within acquired brain injury (ABI) rehabilitation. Consistent with the theoretical approach of occupational therapy, articulating life roles within the patient-directed goal framework is an important, but challenging role for occupational therapists working within ABI rehabilitation. Study objectives are to discuss the barriers and enablers of embedding occupational role discussions within a patient-directed goal framework in a new state-wide ABI rehabilitation service, and suggest actions for program enhancement.

Method: Mixed method study is currently underway. Interview data with occupational therapy staff and families was used to identify barriers and enablers. Auditing of medical records was used to demonstrate the synthesis of roles and goals within occupational therapy documentation.

Results: Goals and occupational role discussions occurred with support across the occupational therapy staff, with preliminary data suggesting the importance of such discussions in preparation for the patient to work on short-term goals that will enable future role participation. Barriers and enablers to embedding occupational role discussions within a patient-directed goal framework will be presented in this paper in the categories of facility, organisational culture, patient/family participation, and the occupational therapy profession. A case study will be presented to assist occupational therapists working outside of our service to translate and implement recommendations based on our study findings in their own practice.

Conclusions: Translating team and patient goals into an occupational role framework empowers both patients and

families to work towards longer term goals following severe ABI.

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Complaints following Mild Traumatic Brain injury (mTBI) and the role of Coping

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Background and aims: Although most mTBI patients recover fully, a minority has long-lasting complaints that interfere with resumption of previous activities. Experiencing substantial complaints early after trauma is commonly viewed as a precursor of a worse recovery. We hypothesized that coping plays a role in recovery and that patients with more complaints have less adequate coping strategies.

Method: Multicenter prospective cohort study of mTBI patients admitted to the Emergency Department. Patients received a baseline questionnaire at two weeks post trauma covering complaints and coping styles. Having complaints was defined as reporting three or more complaints (with at least one in the cognitive- or social emotional domain). Coping profiles were divided in passive versus active coping styles.

Results: The questionnaires were completed by 788 patients (mean age of 39.9 (15.7) years, range 16-65) and GCS scores ranging from 13-15). At two weeks post trauma 53% of all patients reported having complaints. The most frequently reported complaints were headaches, dizziness and increased fatigability. Patients with complaints were characterized by a significantly higher use of an inadequate passive coping style ($t(672) = -3.7, p < .001$), when compared to the patients without complaints.

Conclusions: Early reporting of complaints has been viewed as a precursor of worse recovery following mTBI. Patients with complaints have a passive coping style that could be related to the development of long-lasting complaints. We conclude that coping style is an area of particular interest when it comes to the development of intervention strategies aimed at the prevention of long-lasting complaints following mTBI.

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Recognising Fear of Falling in a Community Rehabilitation Setting

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Background and aims: There are potentially serious consequences of falls for adults with an acquired brain injury, including increased carer burden, increased fracture risk, lower social participation and lower mood (Dennis et al., 2002; Forster & Young, 1995). There is an established research base indicating that falls risk is significant problem for acquired brain injury survivors both in hospital and following discharge (Jorgensen et al., 2002; Nyberg & Gustafson, 1995). However, there is limited research currently available regarding the prevalence of fear of falling with regards to community-based rehabilitation. The purpose of this research was to gain an improved understanding of the frequency of fear of falling as a concern for adults with an acquired brain injury attending a community rehabilitation program.

Methods: The Falls Efficacy Scale-International was administered to 58 participants of the Gold Coast Community Rehabilitation Program at their initial appointment. Participants were adults aged between 18-66 who had experienced an acquired brain injury (e.g. stroke, traumatic brain injury, hypoxic brain injury, brain tumour). Data were collated to determine the frequency of fear of falling for participants.

Results: The results indicated that 17 (29.31%) of participants reported having a high concern regarding falling, 17 (29.31%) of participants reported having a moderate concern regarding falling, and 24 (41.38%) of participants reported having a low concern regarding falling.

Conclusions: More than half of the adults with an acquired brain injury attending a community rehabilitation program reported having a moderate to high fear of falling, indicating that this is a highly relevant issue for this population.

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Using technology to improve care delivery: audio visual care plans as an adjunct tool

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Background and Aims: An aged care and disability service provider in Western Australian employees over 65 nationalities, with only 11 having English as their first language. This increasing linguistic diversity has highlighted that traditional written care plans may not be the most effective method for detailing clients care and support needs. The aim of the study was to determine if audiovisual care plans used in conjunction with written care plans enables support workers to gain an improved understanding of the care and support requirements of clients.

Method: The pilot study was conducted at a slow stream rehabilitation facility for people with an acquired brain injury. A review of audiovisual equipment was undertaken and appropriate clients were identified. An easy to understand three months post implementation survey was completed by the support workers to determine the success of the videos using a rating scale 1-10.

Results: Four clients were identified as appropriate to undertake videoing instruction and 12 audiovisual care plans were completed. In total, 21 staff completed the survey. The results of the survey demonstrated that the combination of written and audiovisual care plans increased the ease of understanding, improved DSWS' confidence and accuracy of care execution and is more helpful than written care plan alone. (9.425 out of 10 compared to 5.9 out of 10).

Conclusion: The incorporation of the audiovisual care plan has been valuable to guide support workers in supporting clients' more effectively during the rehabilitation process. In addition, the audiovisual aids supplements client's learning process and provide clients and their families' tangible feedback of rehabilitation progress.

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Changing mindsets on time in ABI rehabilitation – waste of resources or necessity?

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Background and Objectives: Oats Street is a rehabilitation service for people with ABI who have transitioned from hospital. It is both residential and community based and focuses on individualised outcomes. This study examines the value of providing an extended time for functional recovery,

challenging the notion that significant functional and cognitive improvement following brain injury can only occur during the earliest months of hospital-based rehabilitation.

Method: Oats Street clients are assessed using the Mayo Portland Adaptability Inventory (MPAI-4), with three-monthly reviews and reassessment. Scores for 29 clients were tracked from admission to one year. Matched statistical analyses using MPAI-4 STATA version 13 was used to demonstrate total and categorical change.

Results: There was a statistically significant difference in clients' Total T Score, with an average improvement of 5.96 points ($p=0.0002$). The largest improvement was in the participation subscale, with an average improvement of 7.34 points ($p=0.0000$). It was noted that clients improved consistently for six months, had a consolidation period from six to nine months, then improved again between nine and 12 months. In total, on admission 76 per cent of clients had moderate-severe or severe limitation; after 12 months 45 per cent were classified as moderate-severe or severe limitation.

Conclusions: Oats Street offers consistent relearning of essential living skills in line with client goals, resulting in outcomes important to the individual and essential for independent living. This study hypothesises that embedding new learning into an environment optimal for neuroplastic change is best achieved through provision of extended recovery time.

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Optimising function in a degenerative disease

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Background and objectives: It is imperative to evaluate services in order to understand client's changing support needs over time. This is challenging for people with degenerative diseases due to limited validated measures for this population. The aim of this study was to trial measurement tools to evaluate the service provision for people with Huntington's Disease.

Method: Participants included residents with Huntington's disease living across two supported environments in Perth, Western Australia. A pilot of the Mayo-Portland Adaptability Inventory-4 (MPAI-4) and the Functional Independence Measure and Functional Assessment Measure (FIMFAM) was undertaken. Measures were conducted pre and post at a 12 month interval. Matched statistical analyses using STATA version 13 was used to demonstrate total and categorical change.

Results: In total there were 18 participants with completed MPAI-4 and FIMFAM results. As expected, a reduction in function was observed in the cohort (MPAI-4 Total T Score: 3.42, p -value:0.0183) (FIMFAM: -17.56, p -value:0.0311). The MPAI-4 indicated the largest change in participant's abilities whilst their psychosocial functions did not deteriorate. The FIMFAM demonstrated limited change in the motor items however a decline in cognitive and communicative functions was observed. Both measures highlighted a significant reduction in communication skills indicating a need for further service provision in this area.

Conclusions: Results indicate the benefits of using outcome measures to inform decision making for service provision and resource allocation in order to optimise client's functions. The measures indicated that the living environments supported maintenance of psychosocial and daily living skills despite a measurable reduction in cognitive and communicative abilities.

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Early Perceptual Processing of Faces in Patients with Traumatic Brain Injury: An Event-Related Potentials Study

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Background and aims: Patients with traumatic brain injury (TBI) frequently exhibit deficits in facial expression recognition. However, which stage of the facial expression processing is impaired is unknown. Using event-related potentials (ERP), we investigated the early visual processing of faces in TBI patients.

Methods: Six TBI patients with frontal lobe lesions who exhibited facial expression recognition deficits and 22 healthy adults participated in this study. Participants performed go/no-go tasks with faces, watches, or scrambled faces as target stimuli. During the tasks, we examined N170, an early face-specific ERP component, to evaluate the early facial perceptual process in TBI patients.

Results: Normal participants clearly showed N170 waveforms in the posterior temporal regions (T5, T6) during all go/no-go tasks, and N170 amplitudes elicited by faces were significantly larger than those elicited by non-face stimuli (watches and scrambled faces). On the other hand, in five out of six TBI patients, N170 waveforms were not clearly visible during the tasks. In addition, the TBI patients did not show any face-specific N170 effects, and no significant differences in N170 amplitudes appeared between facial and non-facial stimuli.

Conclusions: These results suggest a dysfunction of early-stage face processing reflected by N170 in TBI patients. Moreover, this dysfunction could potentially underlie facial expression recognition deficits in TBI patients.

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Quality of life for individuals with a vestibular impairment following an acquired brain injury: the person's perspective

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Background and aims: Vestibular impairment is frequently misdiagnosed in a general population and this situation is even more problematic when an individual has suffered an acquired brain injury. The aim of this study was to better understand the physical, emotional and psychological responses experienced by community dwelling individuals who have vestibular impairments due to their acquired brain injury.

Method: A qualitative exploratory study was undertaken. Nine community dwelling individuals, who experienced vestibular symptoms following an acquired brain injury which affected their engagement in chosen activities, were recruited into the study and undertook audiotaped interviews using a guided interview approach. Data was analysed with the assistance of nVivo 10 qualitative analysis software to identify major themes (first via open coding, followed by axial and then selective coding).

Results: Four key themes emerged including: 1) validation 2) definitive diagnosis difficult amongst an array of ABI symptoms 3) vestibular adaption is more difficult when you have an ABI and 4) emotional and social.

Conclusion: Individuals who experience vestibular symptoms as part of their brain injury are not diagnosed in a timely manner, with symptoms often attributed to overall brain injury symptoms or psychosomatic causes. This delay of validation of their symptoms can cause additional stress and anxiety to the person, as well as a subsequent postponement in receiving

the required therapy to manage the symptoms. It is important that all patients who experience a brain injury are screened for a vestibular impairment, and if necessary, receive vestibular rehabilitation including explanation and education

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The Influence of diagnostic terminology on expected acute and chronic symptoms from sport-related mild traumatic brain injury

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Background and aims: The diagnostic terminology to describe mild traumatic brain injury (mTBI) is used inconsistently in clinical and research settings, and there is some evidence that the term mTBI is perceived more negatively compared to terms such as ‘concussion’ and ‘minor head injury’. The research aimed to determine the influence of the diagnostic terms mTBI and ‘concussion’ on people’s expectations of postconcussion symptoms following a sport-related injury.

Method: Participants ($N = 168$; $M_{age} = 24.24$ $SD = 9.39$; 71.9% female) read a vignette describing an incident in which a sport player sustains a prototypical sport-related concussion that only varied according to whether the player in the vignette was described as being diagnosed with a concussion ($n = 25$), mTBI ($n = 28$), or received no diagnosis ($n = 31$) one week post-injury, or concussion ($n = 27$), mTBI ($n = 25$), or no diagnosis ($n = 32$) six months post-injury. The vignette’s depiction of the incident was suggestive of an injury that resulted in a temporary alteration of brain functioning due to a blow to the head, but with no loss of consciousness. Participants rated the extent to which they expected the player to be disturbed by symptoms on the Neurobehavioral Symptom Inventory.

Results: Kruskal-Wallis H tests indicated that there were no significant differences on expected symptom disturbance as a function of diagnostic terminology at one-week postinjury, $\chi^2(2) = 4.29$, $p = .117$, or six-months post injury, $\chi^2(2) = 0.588$, $p = .745$. **Conclusions:** Diagnostic terminology is not associated with participants’ acute or chronic expectations of symptom disturbance after a sport-related injury. As such, factors other than the diagnostic terminology could be more influential in shaping the symptoms people expect from a sport-related injury.

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Experiences of working with people with acquired brain injury in the research context

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Background and aims: Researchers play a crucial role in ensuring the quality of research. Yet, despite the importance of their role, there is little research considering their experiences of working within this field. This study aimed to investigate the challenges and positive experiences of researchers who work with people who have experienced an acquired brain injury and their families.

Method: People who were currently or had previously worked as a researcher in the field of acquired brain injury (using either quantitative or qualitative methods) were invited

to participate in a focus group or individual interview about their experiences. An expert reference group meeting was held to discuss strategies that could be implemented to enhance the researcher experience based on the interview data.

Results: A total of 19 researchers working across 4 different research teams took part in the study. Six interconnected themes were identified: researcher motivation, meaning and fulfilment; human connection; knowing and understanding the role; complexity of brain injury in the research context; the research process; state of the researcher. Recommendations for supporting researchers more effectively from initial training to facilitating closure of the research were identified.

Conclusions: Researchers described a number of positive aspects as well as tensions they encountered in their role. The findings highlight the need to ensure researchers are supported effectively to ensure quality of research studies in the field of brain injury.

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Sleep difficulties one year following mild traumatic brain injury in a population based study

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Background and aims: Sleep quality affects all aspects of daily functioning and is vital for facilitating recovery from illness and injury. Sleep commonly becomes disrupted following traumatic brain injury, yet little is known about the recovery trajectory over time and who is most at risk of persistent problems. This study aims to determine the prevalence of sleep difficulties over the course of one year following a mild brain injury and to identify predictors of persistent poor sleep quality.

Method: This was a longitudinal study of 346 adults who experienced a mild traumatic brain injury (aged ≥ 16 years) identified within a population-based incidence sample in New Zealand. The prevalence of sleep difficulties was assessed at baseline (within 2 weeks), 1, 6 and 12 months, alongside cognitive functioning, daytime sleepiness, post-concussion symptoms, community integration and mood.

Results: One year post-injury, 41.4% of people were identified as having clinically significant sleep difficulties, with 21.0% at a level indicative of insomnia. Poor sleep quality at baseline was significantly predictive of poorer post-concussion symptoms, mood, community integration and cognitive ability one year post-injury. Whilst 44.9% of the sample showed improvements in sleep quality between 6 and 12 months, 16.2% remained stable and 38.9% worsened.

Conclusions: Prevalence of insomnia following mild traumatic brain injury is more than three times the rate found in the general population. Screening for sleep difficulties should occur routinely following a mild brain injury to identify adults potentially at risk of poor recovery.

Interventions to improve sleep are needed to facilitate recovery from injury and prevent persistent sleep difficulties emerging.

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Clinical practices surrounding friendship following TBI

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Background and aims: People with TBI report feeling rejected and less close to their friends. Despite this, there is little known about how Speech Pathologists (SPs) assist in maintaining and developing friendships. Therefore, the aim of this study was to gain foundational knowledge about the extent to which SPs assist with the development and maintenance of friendships.

Method: Australian SPs who work with TBI were surveyed. The online survey included 37 items covering current practices and barriers to working with friends, using both open and multiple choice questions. Descriptive statistics and content analysis were used for analysis.

Results: 68 SPs responded. 27/68 (39.71%) reported that they did work with friends. The main approach involved providing friends with education (23/27). Friends were more directly involved through inclusion in or observation of therapy. SPs' rationales for working with friends are to prevent psychosocial issues and for therapeutic benefit, such as providing functional contexts to work within. The major reasons SPs did not work with friends, was due to difficulty with access to friends and time constraints.

Conclusions: While some SPs in this sample did include friends in a variety of tasks in rehabilitation programs for TBI, there remain barriers to maximising the inclusion of friends in TBI rehabilitation programs.

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Chronic visual deficits following traumatic brain injury

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Background and aims: A range of visual deficits can occur as a result of traumatic brain injury (TBI). Most of the literature in this field has focussed on reporting such findings as single case reports. This investigation summarises some chronic visual deficits in a TBI population.

Method: Fifteen participants (14 male) aged 21 to 60 years (mean \pm SD = 37.5 \pm 10.8) who had sustained a TBI between 1 and 20 years ago (7.7 \pm 6.1), underwent orthoptic assessment as part of a larger study. The visual investigation included assessment of: visual acuity, confrontation visual fields, extraocular movement and ocular alignment. Pupillary reaction and ocular convergence were assessed and the presence of a compensatory head posture and ptosis were noted. Prescription lenses were measured.

Results: The most commonly occurring visual deficit was reduced vision. This was mostly unilateral, yielding relatively good binocular acuity. Of the 10 participants requiring refractive distance correction, 7 were myopic and 6 of these also had astigmatism. Visual fields were full to confrontation in all but one participant who demonstrated general field constriction (likely due to delayed response time to visual target). Exotropia was frequently recorded (n=7) and appeared the result of either direct trauma to the extraocular muscle/s, or the result of a CNIII palsy. Vertical ocular deviation was also noted (n=4). Convergence was reduced (in 6 out of 11 participants), ptosis was recorded (n=1 complete, n = 1 partial) and reaction time to initial saccadic eye movement appeared increased. The most frequently reported visual symptom in this population was diplopia. A compensatory head posture to counteract this was recorded in 2 participants while 2 others wore an eye patch.

Conclusions: Visual deficits following a TBI can persist over time. There is variation in what this population can present with in a clinical setting, depending upon the site and degree

to which the visual system is affected along its course. Some patients adopt compensatory mechanisms to reduce visual symptoms.

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Developing a reading comprehension intervention for adults following ABI

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Background and aims: Following acquired brain injury (ABI), discourse-level reading comprehension (RC) deficits may occur as part of a cognitive-communication disorder. RC deficits can impact participation during rehabilitation and independence at home, with limited evidence for interventions. This research details the development of a reading comprehension intervention (RCI) and service delivery model that is evidence based, consumer focused, and can be delivered by Speech Pathologists (SPs) within current workload constraints during subacute ABI rehabilitation.

Method: Previous findings from the research team were utilised to develop the RCI, including information from (i) a systematic literature review; (ii) a national clinician survey; (iii) SP service delivery in subacute ABI rehabilitation; (iv) evidence-based RCIs from other populations; (v) an external advisory group.

Results: A multiple-strategy RCI was developed, utilising findings from the literature review, survey and evidence-base. The RCI involved content-based reading interventions, a visual and a meta-cognitive strategy. External practice tasks were added, addressing advisory group, survey and service delivery findings. Intervention dosage were based on service delivery models and survey results, with a frequency of 3-4 sessions per week over 4-6 weeks.

Conclusions: A new RCI has been developed that uses a range of evidence and meets service demands. The next phase of research will examine the effectiveness of the RCI via a series of experimental single case studies.

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Patterns of narrative discourse in early recovery following severe Traumatic Brain Injury

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Background and aims: To investigate the nature and patterns of narrative discourse impairment in people with severe Traumatic Brain Injury (TBI) during early recovery and whether these change over time.

Methods: A single image picture description task was administered to 42 participants with TBI at three and six months post-injury. The same task was administered to thirty-seven control participants. All participants' discourse samples were analysed according to procedures of linguistic analysis to produce measure of productivity, informativeness and story organisation. TBI participants' performance was compared with the control group at both three and six months, and TBI participants' performance was also compared across the two time points. Individual performance was examined in conjunction with group comparisons.

Results: Inferential analyses revealed significant differences between the control group and the TBI participants on informativeness at both time points and number of complete episodes at three months, but no significant differences for

productivity measures. There was no significant change for the TBI group between three and six months, however change was found for many individual participants.

Conclusions: Despite the lack of significant group change, the findings of this study are indicative of broad trends of improvement in narrative discourse abilities on measures of informativeness and organisation in the context of impairment.

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“Fatigue is part of who I am and the life I want to lead”: Implementing a clinical model to guide intervention and evaluate outcomes

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Background and Objectives: Fatigue is a common consequence of acquired brain injury (ABI) and impacts rehabilitation outcomes, social participation and quality of life. Development and evaluation of clinical resources to support self-management is required. Application of a model [1] may create a shared understanding, guide clinical reasoning, facilitate self-management and potentially evaluate intervention.

Method: Two women (aged 28 and 30) with ABI (sustained between 2 and 4 years prior to intervention) self-reporting fatigue impacting their life completed 7 group sessions. A shared understanding of their appraisals of fatigue was developed through creating personalised formulations, structured around the model. Permission was obtained from Trust Research and Development Department.

Results: Both participants reported: i) Increased awareness of factors influencing their fatigue; ii) Improved ability to manage their fatigue; iii) Increased sense of control over their fatigue and iv) Reduced impact of fatigue on daily activities. These questions appeared to better represent their needs and valued outcomes compared to the Fatigue Severity Scale, which did not reach cut off for fatigue at outset (3.2 & 5.5). Participants endorsed the model as helpful in terms of validating their experience and developing awareness of factors affecting their fatigue and helpful ways to learn to live with it.

Conclusions: Application of a model of fatigue has value in facilitating individualised self-management following ABI. Intervention requires personalisation in terms of timing, content and evaluation of outcomes. Evaluating outcomes remains complicated because no one measure truly captures the complexity and subjective experience of fatigue following ABI. A phenomenological action research approach is required.

Reference: Ref: Malley, Cooper & Gracey (2014) Fatigue after ABI: a model to guide clinical management. *ACNR*, 14(2):17-19.

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Cognitive and Functional Outcomes after Traumatic Brain Injury: An investigation of COMT *Val¹⁵⁸Met*

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Background and objectives: Polymorphisms in genes modulating neurotransmitters, such as dopamine and norepinephrine, may influence the manifestation of traumatic brain injury (TBI) related cognitive impairments. This study

aimed to investigate whether COMT *Val¹⁵⁸Met* allele status was associated with performance on neuropsychological measures of attention and working memory, executive functioning, learning and memory and speed of information processing in the early rehabilitation phase. The study also aimed to examine whether the COMT polymorphism was associated with longer-term functional outcomes.

Method: Participants were 223 adolescents and adults (71.3% male) with moderate to severe TBI, recruited as rehabilitation inpatients into a prospective longitudinal outcome study. Participants completed a neuropsychological assessment after emerging from PTA, an average of 29.0 days (SD = 26.8) post-injury. The Glasgow Outcome Scale – Extended (GOSE) was completed at 1 or 2 year follow-up.

Results: Results showed no significant difference between genotypes (*Val/Val*, *Val/Met*, and *Met/Met*) on neuropsychological measures (all $p > 0.05$), or functional outcome, as measured by the GOSE, after controlling for age, education and severity of injury. There was no association between the presence of frontal lobe pathology and cognitive performance. Those with greater injury severity (i.e. longer duration of PTA, as measured prospectively using the Westmead PTA Scale) performed more poorly on measures of processing speed and verbal new learning and recall.

Conclusion: It was concluded that there was little support for the influence of COMT *Val¹⁵⁸Met* on cognitive function, or functional outcome measures, following TBI. Future research would best be facilitated by large-scale collaborative, multi-institutional studies.

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Running a memory group with participants with acquired brain injury (ABI) in a university clinic context: Process and preliminary outcomes

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Background and Aims: Everyday memory problems are common following ABI, however access to low cost evidence-based cognitive rehabilitation services can be limited. Additionally, psychology students have minimal opportunities to develop skills in delivering ABI rehabilitation interventions during training. The aims of this research were to evaluate the effectiveness of a compensatory memory skills group program (based on the “Making the Most of Your Memory” manual, ASSBI, 2010), delivered by postgraduate psychology students under supervision in a university clinic, in improving 1) participants’ everyday memory problems and 2) students’ skills in delivering the intervention.

Method: To date, 3 students have co-facilitated 2 groups with a total of 9 participants with ABI. Participant outcomes were assessed using both objective (e.g., RAVLT, RCFT, RPA ProMem) and subjective (e.g., EMQ, CAPM, strategy checklist) memory measures. Student outcomes were measured using student and supervisor ratings on learning objectives, the Maastricht Clinical Teaching Questionnaire, and independent video observation.

Results: Group participants reported more frequent use of strategies and demonstrated improvements on all objective and subjective memory measures, comparable in size to those demonstrated in the original evaluation of the manualised program (Radford et al., 2012). Students demonstrated improvements in the skill areas targeted, and reported a positive supervision experience.

Conclusions: These results provide preliminary evidence that a low cost memory skills group for people with ABI delivered in a university psychology clinic can be effective in both improving participants’ management of memory problems and students’ skills in delivering cognitive rehabilitation interventions.

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Mainstream and assistive technology use by people with acquired brain injury living in shared supported accommodation

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Background and aims: People experiencing severe acquired brain injury (ABI) often require ongoing support over their lifetime. For some, this support may be delivered within shared supported accommodation (SSA). There is limited research on use of technology by people with ABI living in SSA, and its impact on resident outcomes and experiences. This mixed methods case series study aimed to examine: 1) the types of technology used by people with ABI living in SSA; 2) subjective experience of technology use; and 3) impact of technology on support needs and participation levels.

Method: Twenty adults with ABI who were identified technology users and living in SSA were recruited (63% male, age $M=43.7$ years ($R=28-63$ years)). Participants completed a semi-structured interview, demographic survey, the *Care and Needs Scale*, *Psychosocial Impact of Assistive Devices Scale* and *Quebec User Evaluation of Satisfaction with assistive Technology*. Quantitative data were entered into SPSS and reported descriptively. Qualitative interviews were audiotaped, transcribed and thematically analysed.

Results: Participants were found to be most frequently using laptops (50%), tablets (37.5%) or smart phone or desktop computers (31.25% each). Key themes that emerged regarding technology use included positive enablement of social connections; vocational and educational pursuits; sense of safety during community access; and recreation options. Participants reported being least satisfied with technology maintenance and ongoing support services received.

Conclusion: The use of technology by people with ABI living in SSA can positively influence social and community participation. Access to ongoing training and support must be considered in the provision of technology to this group.

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Observations from a New Zealand Memory Team

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Background and Objectives: Dedicated dementia services have been largely non-existent in New Zealand, or limited in their service offerings. As such, it has often fallen to generalist health services or general practitioners to provide such care. Review of such services has shown that care is largely offered late in the disease process, fails to address cultural needs, coordination between services is poor, and limited education or support is available to family/carers. In July 2013 the Memory Team was set up with the aim of improving dementia services offered within Counties Manukau Health.

Method: All referrals to the Memory Team from July 2013 to February 2015 were reviewed in relation to the above aims.

All assessments offered by the team included a comprehensive clinical assessment, cognitive screening, and administration of third-party questionnaires. Further neuropsychological assessment was offered where appropriate. Following initial assessment, diagnosis and treatment planning was discussed, and all individuals diagnosed with dementia were offered ongoing follow-up by the Memory Team.

Results: This presentation will review the assessment and follow-up process for clients/families, and compare the findings with those of other memory clinics/services. It will also provide demographic information about the New Zealand dementia population.

Conclusions: Preliminary analysis indicates that individuals seen by the Memory Team differ from those seen in other memory clinics/services in regards to ethnicity, diagnosis, and age of onset. There is also evidence to suggest that the use of third-party questionnaires in Pacific and other ethnic minority groups may not be valid due to cultural interpretations. Like other services, concerns have been identified in regards to poor diagnosis rates within primary care services and referrals to secondary services occurring relatively late in the disease process.

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SATURDAY, JULY 4, 2015

7.00 – 8.45	Tea/coffee/break item on arrival in Grand Ballroom Foyer and Brisbane Room
7.00 – 8.30	Put Posters up
7.30 – 8.30	Workshop 9
	Chair: Liz Mullaly Venue: Adelaide Room (4th floor) Presenter: Hayley Bennett <i>The legal presumption of mental capacity: Implications for “issue-specific” assessment by clinicians</i>
8.30 – 9.00	POSTER SESSION 3
	Venue: Brisbane Room
9.00-10.00	PLENARY 4
	Venue: Grand Ballroom Chair: Peter Anderson
9.00 – 10.00	International Keynote Speaker: Prof Terrie Inder <i>Protecting the Developing Brain - Improving what we do not fully understand</i>
10.00 – 10.30	MORNING TEA in Grand Ballroom Foyer and Brisbane Room

10.30 – 12.00	CONCURRENT SESSIONS 21 – 24			
	Session 21 Behaviour and Cognition in dementia Venue: Perth Room Chair: Lynette Tippett	Session 22 Traumatic Brain Injury & Crime: The Role of Social Cognition in Offending and Psychiatric Disturbance Venue: Sydney Room Chair: Huw Williams	Session 23 Rehabilitation Support Systems Venue: Melbourne Room Chair: Dana Wong	Session 24 Predicting the outcome of traumatic brain injury Venue: Adelaide Room (4th floor) Chair: Clive Skilbeck
	Phillip Fletcher <i>Abnormal brain reward processing circuitry underpins abnormal music and sound appreciation in dementias</i> Olivier Piguet <i>Longitudinal neuropsychological profiles in behavioural-variant frontotemporal dementia and Alzheimer's disease</i> Fiona Kumfor <i>Patterns of decline: A longitudinal assessment of emotion and behaviour in left- vs. right-lateralised frontotemporal dementia</i> Felicity Leslie <i>Frontier Executive Screen: Brief bedside screening tool of executive functions in dementia</i> Jon Evans <i>An Investigation of the Utility of the Addenbrooke's Cognitive Examination – III for the Early Detection of Dementia in People Over the Age of 75 years</i> Sharon Savage <i>Retaining vocabulary in Semantic Dementia: word retraining improves use, understanding and retention of words</i>	Nick Ryan <i>Prevalence and Predictors of Externalising Behaviour in Young Adult Survivors of Paediatric Traumatic Brain Injury</i> Miriam Cohen <i>Impact of traumatic brain injury (TBI) on expression recognition in delinquent and/or vulnerable adolescents</i> Nathan Hughes <i>The prevalence of traumatic brain injury among young offenders in custody: reflections on a systematic review</i> Huw Williams <i>Screening for TBI in Young offenders in Custody: Findings of high rates of reported injury and a risk of psychiatric morbidity</i>	Gina Geffen <i>Psychosocial and physical outcomes of a multidisciplinary program for management of persistent pain</i> Fergus Gracey <i>Red flags for rehabilitation? An investigation of clinical and social variables that can help predict how people with ABI make use of community neurorehabilitation services</i> Jenny Fleming <i>Development and psychometric properties of the Client-Centredness of Goal Setting (C-COGS) scale for use in brain injury rehabilitation</i> Caroline van Heugten <i>Dynamic testing of cognitive learning potential in patients with acquired brain injury</i> Inbal Luft <i>Effectively supporting people with cognitive and behavioural impairments: Practical training for support workers</i> Tracey Wardill <i>Neuropsychology in action: The development of a model for frontotemporal dementia carer support services</i>	Clive Skilbeck <i>Introduction to the Neurotrauma Register of Tasmania (NTR) & outcome following TBI</i> Matt Thomas <i>Quality of life following traumatic brain injury (TBI)</i> Clive Skilbeck <i>Mood following TBI</i> Gill Ta'eed <i>Referral for rehabilitation & amount of therapy</i> Matt Thomas <i>Summary of findings to date, future analyses, implications for service provision</i> Alice Theadom <i>Persistent problems one year following mild traumatic brain injury within a population based incidence and outcomes study</i>
12.00 – 12.30	AWARDS AND CONFERENCE CLOSE			
	Venue: Sydney Room Chair: A/Prof Tamara Ownsworth and Dr Robert Heaton			
12.00 – 12.10	Thanks to Convenor, Committees and Sponsors			
12.10 – 12.20	ASSBI Student Awards supported by Brain Sciences UNSW and Menzies Health Institute Queensland Kevin Walsh Award Luria Award Travel Award Mindlink Brightwater Award for Interdisciplinary Presentations			
12.20– 12.30	INS Student Liaison Committee (SLC) Student Research Awards supported by the APA <ul style="list-style-type: none"> • Nicole Milne - <i>The right stuff: Hippocampal asymmetry and cognitive decline in Type 2 diabetes</i> • Emily Guo - <i>Validation of Stroke and Aphasia Quality of Life Scale in Singapore</i> • James Gooden - <i>Self-awareness and self-regulation of on-road driving following Traumatic Brain Injury</i> • Sicong Tu - <i>Orientation dysfunction in frontotemporal dementia and Alzheimer's disease</i> • Yvette Alway - <i>Psychiatric Disorders in the first 5-years following Traumatic Brain Injury</i> 			

SATURDAY ABSTRACTS

Workshop 9

The legal presumption of mental capacity: Implications for “issue-specific” assessment by clinicians

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The presumption of intact mental capacity in adults is a tightly guarded and fundamental principle of the common law, as well as being an internationally enshrined human right. This

presumption acknowledges and protects the inherent human right to live a dignified life and make decisions as to how they might do this.

This presumption of capacity continues to operate notwithstanding the existence of some type of mental disorder or mental illness, with the question of incapacity turning rather on whether the person has capacity in relation to a specific legal transaction. In this, legal mental capacity is said to be “issue-specific”. This approach by the courts has major

implications for clinicians who are asked to provide an assessment of “capacity”.

This presentation will provide the legal framework for the presumption of capacity, and will set out how courts have come to view an individual’s capacity in relation to specific legal transactions. To illustrate this approach, the example of capacity to instruct a solicitor will be given, and as a part of this, the role of the clinician and the focus of the assessment process required by courts will be described.

Learning Objectives:

At the end of this workshop, participants should be able to:
Describe the fundamental common law principles relating to the presumption of mental capacity;
Identify various issue-specific capacity questions when asked to provide an assessment of capacity;
State the specific legal test of capacity to instruct a solicitor;
Apply the approach of one issue-specific area of capacity to a range of areas.

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PLENARY SESSION 4

Protecting the Developing Brain - Improving what we do not fully understand

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This plenary will address the underpinnings of the neurobiological impact of preterm birth with insights from magnetic resonance imaging. The imaging techniques that shine light on the regions that are altered will be presented. The two key concepts regarding the impact of preterm birth include brain injury (white matter injury) and altered brain development (poor brain growth and delayed cerebral development in the frontal and temporal regions). Brain injury appears associated with illness severity and physiological instability. Altered brain development is associated both with injury and with environmental exposures including both positive and negative experiences. This plenary will define the nature and timing of these alterations and their associations with subsequent neurodevelopmental and behavioral outcomes. Mediators of the relationship of altered brain development to outcomes in this high risk population will be explored.

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Concurrent Session 21 – Behaviour and Cognition in dementia

Abnormal brain reward processing circuitry underpins abnormal music and sound appreciation in dementias

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Background and aims: Patients with dementia often appear to have retained or abnormal pleasure responses to music, despite other widespread cognitive impairment, and music may offer a potent therapeutic tool in behavioural management of these patients. However, the specificity, breadth and neuroanatomical underpinnings of such altered auditory hedonic responses have not been studied systematically.

Methods: Here we addressed this issue in a cohort of 73 patients representing major canonical dementia syndromes (behavioural variant frontotemporal dementia (bvFTD), semantic dementia (SD), progressive nonfluent aphasia (PNFA) amnesic Alzheimer’s disease (AD)) using a semi-structured caregiver behavioural questionnaire and voxel-based morphometry of patients’ brain MR images.

Results: Behavioural responses signalling abnormal aversion to environmental sounds, aversion to music or heightened pleasure in music (‘musicophilia’) occurred in around half of

the cohort but showed clear syndromic and genetic segregation, occurring in most patients with bvFTD but infrequently in PNFA and more commonly in association with MAPT than C9orf72 mutations. Aversion to sounds was the exclusive auditory phenotype in AD whereas more complex phenotypes including musicophilia were common in bvFTD and SD. Auditory hedonic alterations correlated with grey matter loss in a common reward processing network including, antero-mesial temporal lobe, insula, anterior cingulate and nucleus accumbens.

Conclusions: Our findings suggest that abnormalities of auditory hedonic processing are a significant issue in common dementias and reflect derangement of underlying reward processing circuitry. The potential therapeutic implications of this are discussed.

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Longitudinal neuropsychological profiles in behavioural-variant frontotemporal dementia and Alzheimer’s disease

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Background and aims: Current consensus diagnostic criteria indicate that executive dysfunction with relatively sparing of episodic memory defines the neuropsychological profile of the behavioural variant of frontotemporal dementia (bv-FTD). Nevertheless, the clinical differentiation of bv-FTD from Alzheimer’s disease (AD) remains difficult since executive dysfunction is common in AD, and bv-FTD can present with marked episodic memory deficits early on. This contention, however, is based on cross-sectional studies, and little is known about the stability and progression of these cognitive deficits over time.

Method: Using mixed-model regressions, we investigated the trajectory of performances on general cognition, memory, executive tasks and functional scales over a mean follow-up of 2 years in 22 probable bv-FTD and 31 typical AD patients.

Results: Analyses demonstrated that bv-FTD experienced a more rapid functional deterioration and, despite equivalent baseline performance, a steeper decline in global cognition than AD. At baseline, both groups were significantly impaired on executive function and memory tasks compared to controls, but these deficits were more marked in the bv-FTD group. Bv-FTD showed significantly larger annualised decline than AD on the ACE-R memory domain (-2.9 vs -1.3 z score change) and digit span forwards (-0.4 vs -0.1 z score change).

Conclusions: Despite the different magnitude of impairments, these findings suggest that neither the initial neuropsychological assessment nor projected performances can reliably distinguish the totality of bv-FTD and AD individuals. In turn, tasks that measure social cognition and emotional processing appear to be useful complements to assist with the differential diagnosis between these two dementia syndromes.

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Patterns of decline: A longitudinal assessment of emotion and behaviour in left- vs. right-lateralised frontotemporal dementia

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Background and aims: Frontotemporal dementia presents with changes in behaviour, language and/or social cognition to varying degrees, depending on the pattern of atrophy.

Individuals with left anterior temporal atrophy (left-ATL) show changes in language at presentation, whereas individuals with right anterior temporal atrophy (right-ATL) usually show behavioural change and prosopagnosia. Whether these initially distinct clinical presentations devolve into a similar syndrome with disease progression, however, remains unclear.

Method: 31 frontotemporal dementia patients who presented with predominant anterior temporal lobe atrophy were included. Patients were categorised based on their coronal MRI scan as left-ATL (n=22) or right-ATL (n=9) by a trained rater, blind to clinical diagnosis. 33 Alzheimer's disease (AD) and 25 healthy controls were included for comparison. Participants completed the Addenbrooke's Cognitive Examination (ACE) to assess general cognition, a Face and Emotion Processing Battery and the Cambridge Behavioural Inventory (CBI).

Results: At baseline, all patients showed impaired general cognition compared to controls. Right-ATL also had impaired face perception and emotion recognition, whereas left-ATL were impaired in emotion recognition only. On the CBI, only left-ATL and right-ATL had increased abnormal behaviours, whereas all patient groups had reduced motivation.

Longitudinal analyses revealed that general cognition declined at a similar rate in all patients. In contrast, rates of decline differed across groups on the emotion recognition task, with both left-ATL and right-ATL showing greater decline than AD. On the CBI, all patients showed increased abnormal behaviour over time. In contrast, with disease progression, the left-ATL and right-ATL patients showed greater loss of motivation than AD.

Conclusions: While left-ATL and right-ATL show divergent profiles at presentation, both phenotypes develop deficits in emotion recognition and motivation over time. These findings highlight the pervasive socioemotional deficits in frontotemporal dementia, even in patients with an initial language presentation, and underscore the key role of the anterior temporal lobe in social cognition.

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Frontier Executive Screen: Brief bedside screening tool of executive functions in dementia

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Background and aims: Differentiation between behavioural-variant frontotemporal dementia (bvFTD) and Alzheimer's disease (AD) remains challenging in clinical settings, given the heterogeneity of clinical presentations and overlapping cognitive profiles. Early executive dysfunction is characteristic of bvFTD and is one of the earliest cognitive features; however, it can also manifest at presentation in a subset of AD patients. Neuropsychological assessment of executive functions remains challenging, particularly given time constraints. Brief executive screening tests have been developed but generally show limited discrimination between bvFTD and AD. This study presents the Frontier Executive Screen (FES), a novel screening test that was developed as a

short and sensitive test of executive function, with the view to improve discriminability between bvFTD and AD at presentation.

Method: The FES was devised by combining measures of verbal fluency, inhibitory control, and working memory using item test theory (max score = 15). Items developed were analogous to existing executive tasks.

Results: The FES was administered to 28 patients (bvFTD = 14, AD = 14) matched for disease duration and 32 age- and education- matched healthy controls. The FES total score revealed high discriminability between patients and healthy controls, with 91.7% of participants correctly classified. The FES total score was also a sensitive discriminator of patient group membership. Based on this score, logistic regression analyses correctly classified 71.4% of patients into bvFTD and AD. The FES demonstrated excellent concurrent validity, evidenced by high correlations with existing executive measures.

Conclusions: The FES is a valuable clinical instrument for assessment of executive functions given its brevity (~10 min), simplicity in scoring, sensitivity and specificity to dementia diagnoses.

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An Investigation of the Utility of the Addenbrooke's Cognitive Examination – III for the Early Detection of Dementia in People Over the Age of 75 years

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Background/Aims: To examine the validity of the Addenbrooke's Cognitive Examination-III (ACE-III) in detecting early dementia in a UK memory clinic setting for patients aged 75-85 years of age.

Methods: The ACE-III was administered to 59 memory clinic patients prior to diagnosis. The extent to which resulting scores predicted membership of the dementia or no-dementia group was explored using receiver operating characteristic curve analysis and various other parameters of diagnostic performance. Thirty-three participants (55.9%) were diagnosed with dementia (Alzheimer's disease=56.3%, Alzheimer's disease with cerebrovascular disease=31.3%, and Vascular dementia=12.5%).

Results: The optimal cut-off for detecting dementia was 81 (scores below 81 indicating dementia with sensitivity 0.79, specificity 0.96, positive predictive value 0.96), with superiority over previously published cut-offs (88 and 82) at medium and lower prevalence rates. Years of full-time education had a significant positive relationship with total ACE-III scores ($r=0.697$, $p<0.001$) in the no-dementia group. Exploratory analysis indicated that optimal cut-offs were different for higher vs. lower education groups.

Conclusions: The ACE-III has excellent accuracy for the detection of dementia in day-to-day clinical practice. Lower cut-offs than those specified in the index paper, and consideration of patients' years of full-time education may be necessary to achieve optimal diagnostic performance.

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Retaining vocabulary in Semantic Dementia: word retraining improves use, understanding and retention of words

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Background and Objectives: Patients with Semantic Dementia (SD) experience a progressive loss in vocabulary that significantly impacts everyday communication. Research has shown that word retraining programs can improve picture naming performance; however, evidence of generalizable and sustainable language benefits has been lacking. This study extends on previous research to provide such evidence.

Method: Ten SD patients, whose semantic impairments ranged from mild to severe, completed a 2-month word training program. Regular naming assessments of trained (\cong 60 words) and untrained words (\cong 30 words) were conducted at baseline, during treatment and over a further 6-month period, where possible. Three generalisation measures (video description of household scenes, word-picture matching, and comprehension for household requests) were assessed at baseline and immediate post-intervention.

Results: All participants improved their naming for trained items immediately post-intervention ($p < .001$). Significant improvements were also found in describing household scenes (in 6 participants), matching pictures to a verbal label (in 3 participants), and following verbal instructions (in 3 participants). Of the 8 participants available for follow up, 4 participants showed significant declines in picture naming within 2 months of ceasing practice. If, however, some revision was introduced, all participants were able to maintain at least 80% of post-intervention performance at the 6-month follow up. Extent of revision required was influenced by disease severity but did not exceed an hour each week.

Conclusions: Word retraining benefits in SD can extend beyond picture naming, with evidence for improvements in other expressive and receptive tasks. Although significant losses may occur if training is ceased completely, improvements can be sustained over a 6-month period, with the support of less intense, but ongoing revision.

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Concurrent Session 22 - Traumatic Brain Injury & Crime: The Role of Social Cognition in Offending and Psychiatric Disturbance

Prevalence and Predictors of Externalising Behaviour in Young Adult Survivors of Paediatric Traumatic Brain Injury

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Objectives: A growing number of research studies, undertaken within various national contexts, demonstrate a disproportionately high prevalence of traumatic brain injury (TBI) amongst youth and adult offending populations. Although this research demonstrates a robust association between TBI and offending behaviour, the neurocognitive mechanisms that link TBI to socially maladaptive behaviour remain poorly understood. The present study aimed to investigate rates of clinically significant externalizing behaviour in young adult survivors of paediatric TBI, and evaluate the contribution of pre- and post-injury risk and resilience factors to externalizing behaviour outcomes 16 years after injury.

Method: This longitudinal prospective study comprised 55 young adult survivors of paediatric TBI (M age = 23.85; Injury Age: 1-12 years), representing consecutive admissions to the Royal Children's Hospital emergency department between 1993 and 1997. Cognitive, social and behavioural

functioning was assessed across the acute, 10-year and 16-year post-injury time points.

Results: One of every four young people with a history of pediatric TBI demonstrated clinical or sub-threshold levels of EB in young adulthood. More frequent externalizing behavior was associated with poorer pre-injury adaptive functioning, lower full scale IQ and more frequent pragmatic communication difficulty.

Conclusions: Pediatric TBI is associated with elevated risk for externalizing disorders in the transition to adulthood. Results underscore the need for screening and assessment of TBI among young offenders, and suggest that early and long-term targeted interventions may be required to address risk factors for EB in children and young people with TBI.

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Impact of traumatic brain injury (TBI) on expression recognition in delinquent and/or vulnerable adolescents

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Background/Objectives: To determine whether Vulnerable and Delinquent Adolescents (VDA) with TBI have emotion processing deficits.

Method: In this cross-sectional study we separated participants into TBI or non-TBI groups based on whether they had incurred a substantial lifetime 'dosage' of TBI. Participants were 35 community-based Vulnerable and Delinquent Adolescents (VDA), age between 14 and 19. Measures were: an emotion recognition task, self-report measures of TBI, neuropsychological tests, background information and criminal histories.

Results: Preliminary analysis of a subgroup of the VDA with substantial TBI dosage indicated impairment in expression recognition accuracy. Further analysis of the VDA group and comparisons with population controls will be described.

Conclusion: VDA with TBI appear to have additional deficits in socio-emotional processing relative to those without injury. This may contribute to behavioural and psychiatric disturbance.

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The prevalence of traumatic brain injury among young offenders in custody: reflections on a systematic review

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Background and objectives: In recent years there have been repeated calls for improvements in the recognition of and response to the mental and physical health needs of young people in the criminal justice system. Our research therefore sought to understand the prevalence of experiences of TBI among young people in custody.

Methods: A systematic review of research from various national contexts examined the prevalence of TBI among young people in youth justice custodial institutions, and comparative rates among young people in the general population.

Results: Ten studies were included in the review. Reported prevalence rates of TBI among incarcerated youth range from

16.5% to 72.1%, with variation largely explained by diversity in definition of TBI. There is consistent evidence of a prevalence of TBI among incarcerated youth that is substantially greater than that in the general population. This disparity appears more pronounced as the severity of the injury increases.

Conclusions: The available evidence suggests a range of implications for policy and practice, including the need for: more robust screening and assessment; tailored and responsive youth justice interventions; and greater investment in preventative services, such as family and educational support.

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Screening for TBI in Young offenders in Custody: Findings of high rates of reported injury and a risk of psychiatric morbidity

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Background: Young people in contact with the youth juvenile justice system have well documented vulnerabilities including high rates of mental health and neurodevelopmental disorders. Studies have suggested they may also be at increased risk of traumatic brain injury (TBI).

Objective: 1) To describe the profile of a cohort of juvenile offenders with TBI and associated co-morbidity with other neurodevelopmental disorders, mental health needs and offending behaviour. **Method:** Ninety-three boys aged 15 to 18 years were consecutively admitted to a custodial secure facility. They were assessed using a range of different neurocognitive and mental health measures including the Rivermead Post Concussion Symptoms Questionnaire (RPQ) and the Comprehensive Health Assessment Tool (CHAT).

Results: Eight-two per cent of those interviewed reported experiencing at least one TBI and 44% reported ongoing neuropsychological symptoms. Eighteen per cent of those sustaining a TBI reported moderate-severe post concussion symptoms. Psychiatric complaints, such as self-harm and suicidal ideation, were prevalent, with half of those with TBI with such issues.

Conclusion: TBI is prevalent in juvenile offenders in custody with many experiencing multiple episodes and associated with psychiatric morbidity.

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Concurrent Session 23 – Rehabilitation Support Systems

Psychosocial and physical outcomes of a multidisciplinary program for management of persistent pain

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Background: Multidisciplinary pain management programs (MPMP) are considered best practice for treatment of persistent pain but there is a dearth of psychosocial and physical outcomes measured in the same cohort.

Methods: We studied 358 consecutive first admissions over 5 years to a fortnight-long residential MPMP (mean age 49 years; 59.5 % female). 69.6% had maximum chronic pain gradings of 4. Psychosocial outcomes were measured by scales for Depression, Anxiety and Stress (DASS-21), and Pain Catastrophising (PCS); and Symptom Distress, Interpersonal Relationships and Social Functioning (OQ-

45.2). Physical tests comprised Timed Up and Go (TUG), Six Minute Walk (6MW), Single Leg Balance (SLB), Two Minute Step (2MS), Grip Strength (GS), and Activities-specific Balance Confidence (ABC).

Results: Over the course of the program, all measures showed highly significant group improvements ($p < 0.001$) that ranged from 11-40% (psychosocial measures) and 11-57% (physical measures). The largest improvements (>20%) were in DASS-21 (all three subscales), PCS, TUG, SLB (closed eyes) and 2MS. However there was wide variability in individual responsiveness. The Reliable Change Index that takes into account test-retest reliability is being used to compare individuals against their own baseline.

Conclusions: Clinicians need to know whether particular patients are likely to benefit from a MPMP. We are adding to and interrogating our large database of demographic and clinical variables to find those characteristics that best predict improvements in physical, psychological and social functioning.

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Red flags for rehabilitation? An investigation of clinical and social variables that can help predict how people with ABI make use of community neurorehabilitation services

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Background and aims: Clinical assessment tools are available for identifying patients' rehabilitation needs following hospital discharge. However, in the community not all patients engage and make use of this rehabilitation in the same way, with potential implications for outcomes and funding. This study aimed to identify predictors of different types of community neurorehabilitation service use.

Method: Data from records of 101 consecutively discharged patients with ABI were collated (45 stroke, 20 haemorrhage, 18 traumatic, 18 other; aged 16-85; 57 male). Regression analyses ($n=99$) were used to identify later direct (e.g. face-to-face therapy) and indirect (e.g. multi-professional meetings) contacts from predictor variables including: Needs and Provision Complexity Scale Part A (NPCS-A); Icanho Screening Tool (IST); MPAI-4; demographic and clinical variables.

Results: 40% of clinical contacts were indirect. Multiple regression analysis found prediction of indirect contacts by screening tools was improved by including source of referral, executive dysfunction, lack of capacity to consent to treatment, younger age, and higher social risk (IST: $R^2=0.41$, $p<0.005$; NPCSa $R^2=0.45$, $p<0.005$). Mental health symptoms were not significant in the regression models but significantly correlated with rehabilitation non-attendance.

Conclusions: Screening tools are of value in predicting patterns of service use, but social and neuropsychological factors must be taken into account. Funding arrangements that focus only on direct rehabilitation provision may fail to recognise the range of complexity of needs in community neurorehabilitation and the range of activities rehabilitation professionals provide aside from face-to-face rehabilitation. Investigation of relationships between type of service use and clinical outcomes is warranted.

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Development and psychometric properties of the Client-Centredness of Goal Setting (C-COGS) scale for use in brain injury rehabilitation

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Background and aims: Client-centred goal planning is considered fundamental to acquired brain injury (ABI) rehabilitation and a means of measuring the degree of client-centredness of goal planning processes may be useful in clinical practice. This paper aims to describe the development of the Client-Centredness of Goal Setting (C-COGS) scale and establish preliminary reliability and validity.

Method: A self-report rating scale was developed and administered to 42 participants with ABI soon after planning of their outpatient rehabilitation goals. Data comprised 64 sets of rehabilitation goals for occupational therapy (n=36), speech pathology (n=17), physiotherapy (n=7), social work (n=3) and psychology (n=1). One item was excluded to improve internal consistency. Correlations of C-COGS scores with participants' ratings of goal importance on the Canadian Occupational Performance Measure, and measures of therapeutic alliance, motivation and global functioning were examined to establish construct validity. The scale was readministered in a subsample within a 1 month period on 12 occasions to determine test-retest reliability.

Results: The final C-COGS scale consisted of three subscales measuring goal alignment, goal planning participation, and client-centredness of goals. Strong internal consistency and inter-correlations between subscales was demonstrated. There were moderate significant correlations with measures of similar constructs (goal importance, therapeutic alliance, and motivation) but not with the dissimilar construct, global functioning. Test-retest reliability of items ranged from 0.35 to 0.97 (mean ICC=0.64, SD=0.19).

Conclusions: The findings provide preliminary evidence to support the validity and reliability of the C-COGS scale. The C-COGS may be used to evaluate and improve goal setting practices, and as a measure in research investigating factors contributing to best practice rehabilitation.

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Dynamic testing of cognitive learning potential in patients with acquired brain injury

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Background and aims: Dynamic testing includes procedures that examine the effects of brief training on test performance where pre- to-post training change reflects patients' learning potential. Since dynamic testing has not been used often in patients with acquired brain injury yet, we performed a study into the validity of the dynamic version of the Wisconsin Card Sorting Test (dWCST) in brain injured patients.

Methods: A total of 104 patients with ABI completed the dWCST at rehabilitation admission. Performance of a subgroup (n=63) was compared to patients (n=28) who

completed a repeated administration of the conventional WCST (rWCST). Furthermore, dWCST performance was compared between patients with ABI (n=63) and healthy controls (n=30). Three learning potential indices were used: post-test score, gain score, and a group classification (decliners, poor learners, strong learners, high achievers). Predictive value of group classification for rehabilitation outcome was studied.

Results: The dWCST showed no floor or ceiling effects and the post-test and gain score were significantly intercorrelated. The pre-test score showed no significant associations with other neuropsychological tests. The learning potential indices were significantly associated with language and/or memory. In contrast to the dWCST group, the rWCST group showed no significant pre- to post-test improvement. There were significantly more poor learners in the rWCST group. Compared to controls, patients obtained similar gains, but significantly lower pre- and post-test scores for the dWCST. The ratio of poor learners between-groups was not significantly different. Poor and strong learners differed in participation; poor learners and high achievers differed in QOL after rehabilitation.

Conclusions: The results support the validity of the dWCST for assessing learning potential in patients with ABI.

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Effectively supporting people with cognitive and behavioural impairments: Practical training for support workers

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Background and Aims: Whilst information is available about cognitive and behavioural impairments following acquired brain injury (ABI), support workers aren't necessarily able to effectively translate this information and knowledge into practical support. The aim was to evaluate the impact of specialised training on support workers' knowledge, confidence and self-efficacy for supporting people with cognitive and behavioural impairment after ABI.

Method: An independent, mixed methods evaluation comprised of a longitudinal survey and interviews: pre-training, post-training and follow-up after three months. The two-day training was delivered to three groups (n=60) by an occupational therapist and a clinical psychologist. The training was intentionally practical to maximise learning (including activities, videos, case examples, discussion, etc.), and a comprehensive manual was provided. Evaluation data collected from 105 pre- and post-training questionnaires are presented in this paper.

Results: Improvements in participants' work-related confidence and self-efficacy (an 8-item scale) were statistically significant (p<.001), with practically meaningful gains demonstrated in the most challenging areas of work. Participants also rated their knowledge confidence higher after the training in all areas covered (p<.001), with the greatest objective improvements demonstrated in awareness of active support strategies.

Conclusions: Practical, group training by occupational therapists and psychologists can efficiently impart specialised knowledge and expertise and thus result in improved outcomes. This training equips support workers with the specialist knowledge, skills and confidence required to effectively support people with cognitive and behavioural impairments on a daily basis, thus facilitating increased participation in chosen activities.

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Neuropsychology in action: The development of a model for frontotemporal dementia carer support services

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Background and Aims: Frontotemporal Dementia (FTD) is a young onset form of dementia. It can lead to dramatic changes in behaviour, personality and language. Carers of those with FTD report high levels of burden and social isolation due to the unique and often socially inappropriate behaviours associated with the disease. There is no cure. All we have to offer is support and education. A series of projects over the last six years has examined means of providing support to those impacted by this disease. The aim has been to establish a model of support services for FTD which can be implemented throughout Australia.

Method: A Churchill Fellowship in 2008 provided experience with support groups in major FTD centres in the U.S. & U.K. The first FTD carer support group in Melbourne was subsequently established. Carers were surveyed after two years. Findings provided the template for the Barwon FTD carer support group. Carers attended this group for ten 90-minute group sessions facilitated by a Dementia Consultant and Clinical Neuropsychologist. A structured interview and series of standardised questionnaires were completed pre- and post- intervention.

Results: FTD carers attending disease specific support groups, facilitated by health professionals, report significantly greater levels of emotional and social support. They report feeling less socially isolated, more knowledgeable about FTD and more able to cope with the challenges of their caring role.

Conclusions: Findings from these projects support the development of professionally facilitated, disease specific support services for FTD carers. A cost effective model of support, in which neuropsychologists have the opportunity to play a rewarding role, has been developed. This model can be implemented throughout Australia and has the potential to improve outcomes for FTD patients and their carers.

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Concurrent Session 24 – Predicting the outcome of traumatic brain injury

Introduction to the Neurotrauma Register of Tasmania (NTR) & outcome following TBI

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Background and aims: Although TBI is a common cause of brain dysfunction, traditional measures of outcome have been poor, and measurement has tended to be piecemeal. In addition, prediction of TBI outcomes has been poorly investigated. The symposium provides an introduction to the design, establishment, and functioning of the NTR. This session summarises some of the principal findings from the literature in relation to psychological outcome following TBI. It 'sets the scene' for the subsequent papers, which describe the validation of some more sophisticated measures of psychological outcome following TBI and their employment in predicting outcome. The potential clinical utility of such measures is discussed.

Design and method: An overview of findings from previous research relating to psychological outcome is offered. Previous research has often focussed only on outcome following severe TBI, and outcomes for mild TBI have been

neglected until recently. The NTR was designed as a population study of adult TBI in southern Tasmania. All patients sustaining a TBI, of whatever severity, were invited to participate in the research. The Register has gathered data on a very wide range of variables, including demographic, TBI event-related, and early post-injury psychological measures. In developing robust measures offering clinical utility in predicting outcome, it is important to include the stages of checking out the scales' properties, examining outcomes, looking for predictors, and developing predictive models. Our ultimate goal is the provision of a comprehensive clinical resource based on the predictive equations we have developed, which would have important applications; for example, identifying those who currently have poorer outcomes after TBI.

Results and conclusion: The NTR consists of a very large database of variables, collected from 1200+ participants. It provides a rare opportunity to study a range of psychological outcomes following TBI

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Quality of life following TBI

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Background and aims: To summarise findings from studies investigating the QOLI (Frisch 1994), a generic quality of life measure in a healthy Australian adult sample and a large representative sample of Australian adults with TBI.

Design: Prospective longitudinal design, utilized by the Neurotrauma Register of Tasmania. Also, a cross-sectional convenience sample completed a web-based survey, some of whom provided data on a second occasion.

Method: 1240+ adult TBI patients provided information about their functioning across a range of domains as part of the Register. Also, 259 healthy adults were recruited for a check-norming study on the Quality of Life Inventory in Australia. Analyses included confirmatory factor analyses of QOLI scales, investigation of a range of psychometric properties, analyses of longitudinal outcomes, and regression-based predictive modelling of TBI QOLI outcomes.

Results: The QOLI retained very good psychometric properties in the Australian context. TBI outcome showed an initial decline in scores with a return to pre-morbid levels within 12 months. Predictive models showed Depression and a range of other variables were important predictors of quality of life outcomes following TBI. Prediction scores generated from the regression equations provided useful estimates of participants' actual 12 months post-TBI scores

Conclusion: The QOLI can be used with confidence in Australia to measure TBI outcomes. Clinical application of this work could include identification of those at risk of poor outcome for additional rehabilitation interventions.

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Mood following TBI

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Background and aims: There is little published research predicting emotional outcome following TBI. The present research investigated which variables (demographic, clinical, and psychological/physiological) best predicts TBI mood outcome over 2 years following TBI.

Design: Multiple Regression was employed to determine whether demographic, clinical, and psychological/physiological variables at the initial and 1-month follow-up assessments could predict mood outcome at 3-, 6-, 12-, and 24-month post-injury.

Method: 1044 TBI patients (65% males, mean age = 36 yrs) identified from the Neurotrauma Register database, completed the HADS and other measures within 15 days post-injury, at 1 month, 3 months, 6 months, 12 months and 24 months post-injury.

Results: As hypothesised, a number of variables accounted for a significant proportion of variance in participants' HADS scores (up to 64%). Useful prediction was established both for early post-TBI assessments (3 and 6 months), and at 12 and 24 months post-injury. The most reliable predictors included post-concussion symptoms, pain, pre-injury and initial Subjective Quality Of Life, estimated pre-morbid IQ, and initial HADS scores. Prediction scores generated from the regression equations provided useful estimates of participants' actual post-TBI scores both in the early months post-injury (3 and 6 months), and longer term (12, 24 months).

Conclusions: HADS scores can be predicted using easily-available measures, highlighting the importance of both screening soon after injury and some months post-injury to identify patients at risk of developing mood disturbances up to two years post-TBI. Service implications are discussed.

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Referral for rehabilitation & amount of therapy

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Background and Aims: Summarise studies predicting referral for TBI rehabilitation, and amount of therapy provided, using demographic, injury-related and clinical variables from the Neurotrauma Register of Tasmania (NTR).

Design: ANOVAs and Chi2 analyses were employed to analyse demographic, injury-related and clinical variables' relationships with referral and therapy. Regression equations were developed to assist in predicting referral patterns and amount of therapy received.

Method: For 175 TBI patients referred to the Community Rehabilitation Unit, analyses identified referral factors for each clinical discipline, number of disciplines and amount of therapy.

Results: 54 CRU patients were referred by hospital/local health services, with 121 referred by NTR staff due to a perceived gap in service provision. Longer PTA was associated with referral to more CRU disciplines ($p = .006$) but not with more therapy. Nursing and Psychology received most referrals. Referral to traditional rehabilitation disciplines (Physiotherapy, Occupational Therapy) was associated with longer PTA, older age, hospitalisation and functional dependence. Referral to less-traditional disciplines (Nursing, Psychology) was associated with more post-concussion symptoms, younger age, assault-related TBI, and anxiety. Variables shown to be associated with referral to disciplines or amount of therapy were further examined using regression methodology.

Conclusions: No recognised Tasmanian pathway existed for non-hospitalised TBI patients to access public rehabilitation, even when reporting high levels of PCS and psychological distress. Non-traditional disciplines, such as Psychology, may be useful in addressing violence-related aetiology, psychological symptoms, and previous TBI, all of which are associated with poorer outcomes. Ability to predict service-use and amount of therapy will assist planning of rehabilitation services.

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Summary of findings to date, future analyses, implications for service provision

Aims: This final presentation has a number of aims:

- To summarise and integrate the three 'prediction' papers.
- To highlight applications of the predictive models for clinicians.
- To discuss possible future directions for the Tasmanian Neurotrauma Register, and the development of a comprehensive clinical resource that predicts patient outcomes
- To engage the attendees in an open discussion of these points

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Persistent problems one year following mild traumatic brain injury within a population based incidence and outcomes study

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Background and aims: The effects of moderate and severe traumatic brain injury are well known. Yet despite 95% of injuries being classified as mild in severity, less is known of the long term effects of mild traumatic brain injury. This study aims to determine whether people sustain any persistent effects one-year following a mild traumatic brain injury, and to identify the predictors of health outcomes.

Method: This study was a longitudinal study of N = 341 adults (≥ 16 years) identified within a population-based incidence sample in New Zealand. Participants completed assessments on post-concussion symptoms, mood, cognitive functioning, quality of life and global functioning at baseline and 12 months post injury.

Results: Nearly half of the participants (48.5%) experienced four or more post-concussion symptoms and scored below the New Zealand mean on the mental (48.1%) and physical (47.4%) components of health related quality of life. One year following injury 29.3% reported moderate or severe anxiety, depression (12.1%), cognitive impairment (10.9%) or poor global functioning (10.4%). Having one or more comorbidities, a history of multiple brain injuries, living alone, being of non-European ethnicity and female gender were significant predictors of poorer outcomes at 12 months $p < 0.001$.

Conclusions: Whilst some people recover well following mild traumatic brain injury, nearly half are likely to continue to experience persistent difficulties at least one year later. Monitoring of recovery from mild traumatic brain injury may be needed to ensure interventions are provided for those experiencing persistent difficulties. Demographic and injury characteristic predictors of poor outcomes should be taken into account in treatment planning following injury, with consideration for the context (co-morbid conditions and history of brain injury) within which the injury was sustained.

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SATURDAY POSTER ABSTRACTS

Differences in brain activities of Japanese interpreters and Japanese monolingual speakers during working memory tasks measured by using functional near-infrared spectroscopy

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Background and Objectives: Regarding late second language (L2) speakers, recent research has discussed working memory (WM) in L2 acquisition (Paulesu, 2009). Our research objective is to compare the most relevant regions for WM between Japanese (JPN) interpreters and JPN monolingual speakers (L1s).

Method: The participants were two JPN trilingual interpreters (L3) and eight healthy L1 speakers. We made four JPN files, two each for letter span (LS) and digit span (DS). Each LS file comprised five sets. One set comprised five seconds (s) of white noise (WN), 10 s of soundless interval, and five JPN moras. Each DS file comprised five sets. One set comprised five s WN, 10 s of soundless interval, and five JPN digits. In the hearing task of the LS procedure, the participants were instructed to listen to the WN and five moras. In the retaining task, they were instructed to retain the five moras for five s and then recall them. The DS procedures were identical. Relative changes in oxyhemoglobin (OXY-Hb) during the DS and LS tests were measured using the FOIRE-3000 near-infrared brain imaging system (Shimadzu Corporation). We compared relative changes in OXY-Hb between the hearing and retention task activities.

Results: For L3s, during the DS tests, right superior temporal gyrus (STG) had the greatest difference between the hearing and retention task activities; on the other hand, during the LS tests, Left STG had the greatest difference between the hearing and retention task activities. For L1s, during both tests, bilateral wide areas had the great differences between the hearing and retention task activities.

Conclusions: In the English naming tasks, the brain activities of JPN L2s were localized to a small region (Sakai, 2009). For JPN L3s, the brain regions relevant to JPN WM were small. The brain activities of L3s were also efficiently and effectively localized within small regions in the JPN WM tasks.

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Bicycle Drawing Test: Results of Czech Older Adults and Patients with Cognitive Deficits

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Background and aims: The Bicycle Drawing Test (BDT) is used in neuropsychology to assess visuospatial and executive functions. The aim of this work is to provide normative data for Czech older adults and to compare them to patients with cognitive deficit due to Alzheimer's disease (AD).

Method: 287 drawing of cognitively healthy older adults (mean age 74.9, SD 8.22) were evaluated according to Lezak's BDT scoring. Their results were compared to a group of age and education matched patients with cognitive deficit due to Alzheimer's disease (mild cognitive impairment – MCI, or dementia).

Results: Correlations of age and education with the results of cognitively healthy individuals were low, therefore the norms are not stratified according to these variables. However, men performed higher than women; we present percentile norms according to gender. We also present results of patients with MCI and dementia due to AD. Sensitivity and specificity of the scores is calculated. Examples of drawings and scoring are given.

Conclusions: BDT is a useful method of assessment visuospatial and executive functions in neuropsychological examination. We present normative data.

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Learning curves revisited: growth curve mixture modelling of visuo-spatial and verbal learning

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Background and aims: Evidence suggests that learning (both verbal and visual) is related to executive function, in particular the ability to organise learning and use strategies and cues.

Studies of either verbal or visual learning reveal better learning ability in participants with higher versus lower executive abilities, and this difference has been related to frontal cortical thinning. However, to our knowledge, no studies have explored the relationship between learning ability and executive skills across both visual and verbal domains in both a memory clinic and a healthy sample. We hypothesised that individuals with higher trial 1 scores on one task would have higher trial 1 scores on the other and that faster learners on one task would, likewise, be faster learners on the other, and that both intercept and slope scores would correlate with executive functions.

Method: Data from community (n=647) and memory clinic samples (n=300) on the Location Learning Test - Revised (LLT-R: all), a test of visuo-spatial learning, and on the Rey Auditory Verbal Learning Test (RAVLT; Memory Clinic: n=278; Community: n=195) were decomposed into initial recall (intercepts) and learning (slopes) across 5 trials using latent growth mixture models. Executive covariates were then used to predict intercept and slope latent scores for each sample.

Results: Trial-level increases in the LLT-R and the RAVLT followed an approximately logarithmic shape. As predicted, higher intercepts on the LLT-R were associated with higher intercepts on the RAVLT ($p < .001$), however, there were no significant associations between slopes, in either sample. In the Memory Clinic sample, Digits backwards ($p = .022$), Brixton Spatial Anticipation Test ($p = .008$), Trails ($p = .024$) and Raven's ($p = .049$) performance correlated with RAVLT intercept scores but not the slopes, and Stroop scores did not correlate with either.

Conclusions: The unexpected failure to find an association between learning slopes and executive function may relate to failure in previous studies to decompose initial recall from

learning over trials. However, this does not account for the failure to find a relationship *between* slopes across tasks. Results will be discussed in relation to the verbal versus visuo-spatial nature of the tests, as well as the cued vs. free recall nature of the tasks.

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A systematic review of the effects of Deep Brain Stimulation (DBS) on cognition and mood

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Background Deep brain stimulation (DBS) is a state-of-the-art neurosurgical therapy for neurological and neuropsychiatric disorders. In some patients, unwanted and potentially devastating side-effects occur. For example, stimulation of either motor or limbic territories of the DBS target for Parkinson's disease, the subthalamic nucleus, is thought to mediate DBS effects on movement and mood, respectively.

Aim The aim of this systematic review was to analyse the literature regarding the effects of DBS for movement disorders on cognition, mood and motor function (pre- versus post-DBS).

Materials and Methods An electronic literature search complemented by manual searching was performed to gather data on studies reporting changes in the areas of cognition, mood and motor function (or any combinations of these three) post DBS surgery. Focus was particularly directed to those studies reporting both pre and post surgical measures across these domains.

Results and conclusions -There are number of reports highlighting DBS-induced effects on cognition and mood during DBS treatment of movement disorders, such as Parkinson's disease, yet these are generally small in scale, lack pre-operative assessments, and vary in follow up durations. Comprehensive prospective research studies would add valuable new data on the neurobiological mechanisms mediating DBS-induced alterations in neuropsychiatric function. In turn, this may contribute valuable new insight towards development of future mood stabilisation therapies.

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Mediation means in spatial memory

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Background and aims: Human mnemonic activity is mediated by different kinds of external signs. The ability for mediation depends on the activity of specific brain structures. The study aimed to reveal cerebral mechanisms related to various cues in visuo-spatial working memory.

Method: 17 subjects aged from 22 to 35 years had to memorize the pattern of movements of the visual stimulus in the 3x3 square matrix. There were five conditions of memorization: 2 without mediation, 1 mediated by numbers in each square of the matrix, 1 mediated by images and 1 mediated by short words. During the tests, EEG (21 channels, monopolar) was registered. We calculated averaged ERPs of

all subjects for each part of the test and stimuli type. Each individual ERP was presented as a number of equivalent dipole sources, located in brain structures, according to Talairach Atlas labels (Vartanov, 2002).

Results: All three types of mediation improved remembering of spatial information. All participants showed maximum memory capacity in case when memorizing was mediated by numeric cue. In comparison with numeric mediation, word and image mediation presented two different patterns of brain activity, estimated as a number of activated structures. In case of word and images mediation brain activity was relatively higher in the right hemisphere, while in case of numeric mediation the left hemisphere was more activated. It can be suggested, that increased activation of left hemisphere demonstrates the processes of encoding spatial information into successive form, which provides the efficiency of numeric mediation.

Conclusion: Numbers structures, which are frequently used in human practice, increase brain activity and improve memory capacity.

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Person identity processing in the Capgras delusion:

Assessment of overt and covert processing

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Background and Aims: The Capgras delusion is the delusional belief that a personally significant other person, often a family member or a loved one, has been replaced by a visually similar impostor. The seminal cognitive neuropsychiatric account of the Capgras delusion was proposed by Ellis and Young (1990), who noted that two processes are involved in the normal identification of a person from their face: (1) overt identification of the face, and (2) an affective response to the face. The authors propose that the content of the Capgras delusion is generated by the absence of a normal heightened affective response to the face of the loved one, which conflicts with overt identification of the loved one's face. Empirical support for impaired affective responses to familiar faces has been established in the Capgras delusion, however limited research has been conducted to investigate whether the impairment in person identity processing is modality specific (i.e., limited to visual stimuli). This study aims to investigate the contribution of both face and voice processing to the development of the Capgras delusion.

Method: Person identity processing across modalities was investigated in a single case of the Capgras delusion (case SM). Detailed investigation of face and voice processing included assessment of overt identification and autonomic responses (i.e., skin conductance response and pupil dilation) when presented with famous versus unfamiliar faces and voices, as well as personally familiar versus unfamiliar faces and voices.

Results: SM's overt identification of faces and voices did not differ significantly from performance of the control sample. Overall, the general pattern of SM's results for autonomic response measures showed larger autonomic responses for familiar stimuli compared to unfamiliar stimuli. SM demonstrated some differential autonomic responses (i.e., a larger response when viewing familiar stimuli compared to unfamiliar stimuli) to both famous faces and voices.

Conclusions: Demonstration of differential autonomic responses in SM does not appear compatible with an affective response account of her Capgras delusion. Findings are considered with reference to alternate cognitive accounts of the Capgras delusion.

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Strategic monitoring in time based-prospective memory tasks: the role of the Anterior Cingulate Cortex from an EEG and ICA approach

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Background and aims: Theories in prospective memory propose that time-based intentions are self-initiated based on strategic monitoring, which may require active maintenance of the intention plus external time checking. However, what the nature of strategic monitoring is and how it operates has not been clearly defined. The following questions were addressed: what does monitoring mean, and what are the brain mechanisms underlying intention maintenance, in time-based prospective memory task?

Methods: 24 participants were asked to reset a clock every 4 minutes while performing a foreground ongoing word categorisation task. They were also allowed to check the time as much as they needed with the only constraint of maintaining a good performance in the word categorisation task (every time the time was checked, some trials of the ongoing task were missed). Electroencephalographic (EEG) activity was recorded throughout the task. Independent Component Analysis was used to find relevant brain signals and most probable source locations.

Results: Behavioural results showed that participants with high performance (accurate clock reset at 4 minutes) used internal time estimation during the first minutes and switched to external time estimation (clock checks) towards the 4-minute target time. EEG activity close or in the Anterior Cingulate Cortex, Brodmann area 24, showed a decrease in theta synchronisation and increase in alpha suppression when participants performed the ongoing task while maintaining the time-based intention, particularly for those who showed better performance. **Conclusion:** We propose that time estimation and executive control of attention are the mechanisms underlying strategic monitoring in time-based prospective memory tasks, by means of activity in the Anterior Cingulate Cortex. Further work is currently ongoing in our lab to study the role of the Anterior Cingulate Cortex in free-movement conditions for improved ecological validity.

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Cross-cultural validity of U.S. longitudinal norms in Australians

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Background and aims: While US longitudinal norms to reliably detect cognitive change are widely used in Australia, validation of these norms in an Australian context has not been established. To address this question, we applied longitudinal norms developed on a US sample ("US norms for change") to an Australian cohort. These norms quantify cognitive change across a battery of neuropsychological (NP) measures and use the multiple standardised regression-based (SRB) approach to correct for baseline overall cognitive competence and key demographic factors. The battery assessed domains of attention, working memory, psychomotor speed, episodic memory, motor functions and language.

Method: The US norms for change were developed on a sample of 296 Americans (age range=18-66; 208 males) assessed on two occasions. The norms were applied to 48 Australians (age range=43-67; 42 males) who were also tested on two occasions (mean test-retest interval: 25.27 ± 5.06 months). To assess norm equivalence between countries, we used a battery-wide SRB summary change score and the proportion of individuals who changed (declined or improved) versus were stable (no change) (90% confidence interval, 2-tailed around the mean SRB summary change score).

Results: No significant difference was found between the US and Australian samples with respect to SRB summary change score ($p=.950$) or proportion of change versus no change ($p=.651$).

Conclusions: The study provides preliminary validity of the US norms for change in Australians. A larger study in a more demographically diverse sample of Australians is warranted in order to further assess the validity of the US norms.

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Pizzas and Papadums: An alternative to the Clock Drawing Test for the assessment of cognition in people who are illiterate

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Background/Aims: Several cognitive screening tools have good diagnostic accuracy in detecting dementia, though there has been very little examination of their use with illiterate populations. In some, including the Addenbrookes Cognitive Examination (ACE III), a clock drawing test (CDT) is included. The CDT requires familiarity with writing numbers and is affected by level of education. We need an alternative to the CDT that is sensitive to similar cognitive impairments, but does not require literacy skills, particularly for use in developing countries.

Methods: We developed, and evaluated the validity of, a task designed to make similar cognitive demands to the CDT, which does not require the ability to read or write. The Pizza/Papadum test involves the participant folding and tearing an 18cm circle of paper into six equal slices.

Results: Twenty eight participants (mean age 78.5, sd=9.03) who underwent cognitive assessment within NHS Greater Glasgow and Clyde older adult services took part. Participants completed the ACE III and the Pizza Test. Performance on the Pizza test correlated significantly with performance on the CDT ($\rho=0.643$, $p<0.001$) and the total ACE III score ($p<0.001$). ROC analysis demonstrated better diagnostic power for the Pizza test (AUC 0.846) compared with CDT (AUC 0.669). Negative correlations were found between age and CDT ($\rho=-0.496$), Pizza test ($\rho=-0.531$) and ACE-III ($\rho=-0.450$). No effects of education were observed.

Conclusions: The Pizza test does appear to capture the same cognitive domains that have been assessed in the CDT and is a promising alternative for people who are illiterate.

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An Evaluation of Language In Brain Tumour Patients Using A New Cognitive-Motivated Testing Protocol

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Background and aims: Current literature presents variable results regarding language capabilities in brain tumour patients. Consequently, we have developed a new neuropsychological test battery, the Brief Language Assessment for Surgical Tumours (BLAST), to specifically evaluate language in this population. The BLAST adopts a core skills approach, which examines 11 core cognitive skills derived from current cognitive and psycholinguistic theories. **Method:** We administered the BLAST to 40 undifferentiated tumour surgery patients, both pre and postoperatively; also tested were 60 healthy controls. We examined overall test performance, and core cognitive skills scores in order to evaluate the incidence of language impairments, as well as the effects of lesion localisation on language performance. We also used Voxel-Based Lesion Symptom Mapping to determine the anatomical predictors of each cognitive skill. **Results:** We found that 94% of preoperative, and 90% of postoperative patients were impaired in at least one task. Also, 68% and 58% of pre and postoperative patients were impaired on at least one cognitive skill. It was also found that patients with a left posterior tumour had significantly lower scores than all other anatomical groups on: *accessing semantic knowledge, lexical selection and phonological encoding*. Conversely, patients with a left frontal tumour had significantly lower scores on: *articulatory motor planning and verb retrieval*. Voxel-Lesion-Symptom-Mapping analysis corroborated these findings.

Conclusion: A core skills approach may be a more effective means of assessing language in tumour populations than tools that emphasise overall task performance. Such derived measures are sensitive to language impairments, and are less likely to be confounded by nonlinguistic impairments. The scores derived here are also associated with specific neural substrates, making them potentially useful in guiding surgery and reducing postoperative linguistic deficits.

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Exploring the Basis of Cognitive Language Difficulties in a Tumour Population

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Background and aims: Much is known about language following stroke, yet few studies have examined clinical outcomes in other aetiologies, such as neurological tumours. Consequently, little is known about the long-term effects following tumour resection surgery. Investigating a) whether pre or post-operative assessment is predictive of performance three months post-operatively, and b) which core language skills are the most sensitive and indicative of future impairment, can lead to better care planning and long-term rehabilitation strategies. In addition, it is unclear whether anterior language skills reflect processes specific to the verbal domain, or domain general processes. Addressing this will lead to new insights into the relationship between language and more generalised cognitive processes

Method: 25 tumour patients are assessed 3 months post-operatively on a comprehensive neuropsychological protocol. Individual performance on language tasks is compared with

performance on their nonverbal analogues, as well as pre and post-operative performance on the same tasks, which were taken as part of a previous study

Results: Performance remains impaired 3 months after surgery. Preoperative performance appears to serve as a predictor of later performance. Anterior language skills appear to be domain specific-suggesting the skills needed for verbal tasks are functionally distinct than those required for nonverbal tasks

Conclusion: Cognitive and language impairments are not acute effects that recover spontaneously. Cognitive control skills, verbal tasks, and their nonverbal analogues appear to dissociate, which supports models of fractionalisation

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Distinct functional connectivity of the hippocampus during semantic and phonemic fluency

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Background and aims: Verbal fluency tasks are used in neuropsychological practice for assessment of language function in a variety of neurological disorders. Despite a large body of knowledge in the area of semantic processing, critical aspects of hippocampal involvement in verbal fluency have not yet been explored. Such aspects are lateralization and inter-regional functional connectivity of the hippocampus with brain areas involved in semantic and phonemic fluency. The aim of this study was to examine hippocampal contribution to verbal fluency using functional Magnetic Resonance Imaging (fMRI).

Method: Eighteen healthy volunteers performed an fMRI-block designed adaptation of the semantic and phonemic verbal fluency test while being scanned. Mean activity and inter-regional functional connectivity with known task-related brain regions were examined. Given the clear lateralization of brain areas involved in language, lateralization of hippocampal involvement in verbal fluency was also investigated.

Results: Greater change in activity was seen during semantic fluency, as compared with phonemic fluency. This pattern was obtained in the right and left hippocampus, with no lateralization effects. During semantic fluency, functional connectivity levels between the hippocampi and components of the semantic network did not differ from connectivity levels within the semantic network. In contrast, during phonemic fluency, the hippocampi were less correlated with components of the phonemic network, as compared to the within phonemic network connectivity. Importantly, hippocampal connectivity with the semantic network was task-dependent and restricted to periods of semantic fluency performance.

Conclusions: Results suggest that the right and the left hippocampus are integral components of the brain network that supports verbal semantic fluency, but not phonemic fluency. This should be considered when assessing language function in patients with hippocampal damage.

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Feasibility and initial report on the use of the dot probe task to detect selective attention to threat following acquired brain injury

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Background and aim: Research into cognitive-affective mechanisms shows selective attention to threat, (as measured by experimental paradigms such as the 'dot probe' task), is common across anxiety disorders. No acquired brain injury (ABI) studies have applied such paradigms despite evidence for elevated anxiety and threat appraisals. This study sought to explore the feasibility of the dot probe task in an ABI sample, and identify whether people with ABI show an attentional bias to threat versus neutral stimuli.

Method: Inclusion criteria were more than 6 months post ABI, aged 18 or over, and medically and cognitively able to consent and participate. Those with significant past history of psychiatric disorder were excluded. Participants completed the dot probe task (neutral and threat stimuli conditions), neuropsychological assessment, and the Hospital Anxiety and Depression Scale (HADS).

Results: 32 / 35 participants with ABI (6 female; age 24-69 years) completed all measures. Repeated measures analysis of covariance failed to identify significant main effect of dot probe condition controlling for executive functioning (EF; $p = .234$), which approached significance when EF was not controlled for ($p = .053$). For those rating mild-severe symptoms on the HADS, effect size of response times for threat vs neutral stimuli were medium, but effect sizes were small for HADS non-distressed.

Conclusions: The dot probe task is feasible for people with ABI. No selective attention to threat was identified in the sample. A fully powered study to test contribution of executive deficits and emotional distress to selective attention to threat is warranted.

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Perceived impact of multiple sclerosis predicts poorer community participation: what roles do anxiety and depression play?

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Background and aims: Despite community participation being an important goal of rehabilitation for people with neurological conditions, there has been limited exploration of modifiable factors that can be targeted during therapy to promote its achievement for people with Multiple Sclerosis (PwMS). This study examined whether perceived impact of MS and associated distress predicted community participation, and tested whether anxiety and/or depression mediate this relationship.

Method: 73 community-dwelling PwMS completed the Community Integration Questionnaire, Perceived Impact of Problem Profile and Hospital Anxiety and Depression Scale. The relationship of perceived impact and distress with community participation was analysed using linear regressions. The mediation models were tested using the *Joint Significance* procedure and distribution of the product method.

Results: Greater perceived impact of MS on self-care, psychological well-being, participation, mobility and particularly relationships predicted poorer community participation. Anxiety partially mediated the mobility and relationships impact models. No mediating effect was found for depression.

Conclusions: The findings enhance understanding of the link between perceived impact of MS and community participation, whilst highlighting the influential role of anxiety on outcomes. However, this relationship is complex. Further research is recommended to determine whether psychosocial interventions targeting perceived impact and anxiety would improve community participation outcomes for those living with neurological conditions.

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Validation of the Stroke and Aphasia Quality of Life Scale in Singapore

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Background and aims: Singapore has few studies investigating Health-related quality of life (HRQoL) in stroke survivors, and none involving people with aphasia (PwA). The Stroke and Aphasia Quality of Life Scale-39g was previously found to be relevant for stroke survivors with and without aphasia in the UK. We investigated its validity in Singapore.

Method: Adaptation of the SAQOL-39g was completed resulting in a Mandarin version: the SAQOL-Csg. The SAQOL-Csg was used with Mandarin speakers while the SAQOL-39g was used with English speakers. Stroke survivors were recruited at 3 months post stroke and underwent a series of questionnaires. This included: NUHS Aphasia Screening Test, Barthel Index, Modified Rankin Scale, Mini Mental State Examination, Frontal Assessment Battery, Center for Epidemiologic Studies Depression Scale, EuroQol Health Questionnaire and the SAQOL-39g/CSg.
Results: Of 108 eligible participants, 97 (89.8%) participated and 94 (87%) were able to self-report and are presented here. Both the SAQOL-39g/SAQOL-Csg showed good internal consistency ($\alpha = 0.96/0.97$), test-retest reliability (ICC = 0.99/0.98), convergent ($r_s = 0.64-0.81$ and $0.66-0.88$ respectively) and discriminant ($r_s = 0.35-0.53$ and $0.48-0.62$ respectively) validity.

Conclusions: Both the SAQOL-39g and SAQOL-Csg demonstrated good reliability and validity. Further research is warranted to examine its use with people with more severe stroke and with stroke survivors over time.

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Gesture, speech, and the lopsided brain

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Background and aims: The human mirror neuron system has been implicated in language functions given that the two systems overlap considerably. But while the observation of an action activates a bilateral network, language is processed asymmetrically in the human brain, favouring the left hemisphere in most individuals. It is not yet known whether a similar bias exists when processing gestures.

Methods: A word generation paradigm during fMRI was used to determine the language dominant hemisphere in a large group of right- and left-handed participants. For the gestural task, stimuli consisted of short video clips of an actor performing pantomimes and performing sign language. The degree of asymmetric processing within different regions of the action observation network was then related to individual hemispheric language dominance patterns.

Results: Observation of gestures elicited a bilateral network in frontal, parietal and temporal regions, which was biased to the left hemisphere in participants with left-hemispheric language dominance. Individuals with right-sided language showed either the reverse or a lack of asymmetry. This effect was particularly evident in the two core regions of the putative human mirror neuron system, BA 44 and area PFT, respectively.

Conclusions: The networks for processing speech and gestures show similar hemispheric preference, suggesting a common origin of these two systems in the human brain. The results support the idea of a gestural origin of language with a probable involvement of the mirror neuron system in the evolution of modern speech.

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Emotion regulation in adolescents with mental health problems: An experimental study

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Background and aims: Current literature points to a consistent association between poor emotion control and psychopathology in adolescence, a critical developmental period during which most adult mental health problems emerge. However, nearly all of the studies in this literature have assessed emotion regulation in non-clinical cohorts, or indexed this construct using only self-report methodology. Further, it remains to be established whether there are objective differences in how effectively adolescents with mental health problems are able to apply different strategies to regulate, not only subjective experience, but also the outward display of emotion.

Method: The present study compared adolescents with a mental illness ($n=41$) to demographically matched controls ($n=45$) on an experimental task which required them to either suppress or amplify their emotion expressive behavior in response to images that were negative or positive in affective valence.

Results: Clinical participants (like controls) showed evidence of being able to appropriately regulate their behavioural expression of emotion, indicating that the presence of mental health problems in adolescence does not prevent a basic level of control being exercised over the emotions that are expressed to others. However, the capacity to amplify expressive behaviour was reduced, particularly for negative emotions. In addition, poorer emotion regulation in the clinical group was related to reduced quality of life.

Conclusions: Specific aspects of emotion expressive behaviour are disrupted in adolescents with mental illness, with potentially important implications for wellbeing.

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A case of touch-color synesthesia elicited by deficit in the left medial parietal lobe

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Background and aims: It has been suggested that some patient with brain injury showed the synesthetic experiences, in which stimulation of one sensory modality automatically causes an additional percept in a second, unstimulated modality. One of the most common forms of synesthesia is grapheme-color synesthesia, in which viewing letters or numbers elicits the experience of colors (Weiss et al., 2007). Although many forms of synesthesia (e.g., sound-color synesthesia, vision-touch synesthesia etc.) have been reported in both healthy subjects and brain-damaged patients, there is few research on touch-color synesthesia. In this study, we report that a patient with brain tumors showed a new form of synesthesia in which stimulation of somatosensory modality induces visual perception of colors.

Method: The patient was 48 year-old, right-handed female suffering from brain tumors which were primarily located in the left medial parietal lobe and the posterior cingulate cortex. In order to remove the brain tumors, she underwent awake craniotomy. Before and after surgery, we examined the strength of the sense of touch and assessed colors triggered concurrently with the sense of touch.

Results: Before surgery, the patient reported the perception of white color when stimulated the contralesional parts of the body with her eyes closed; on the other hand, she perceived the orange color, when stimulated the ipsilesional parts of the body. The patient also reported she had never felt such a visual sensation from tactile stimulation before brain damage. The assessment of the strength of touch revealed that the touch to the contralesional side were weaker than that to the ipsilesional side. During and after surgery, there was no perception of colors of touch and no difference of the strength of touch between contralesional and ipsilesional side.

Conclusions: Touch-color synesthesia, in which tactile stimulation induces the sensation of colors showed the rule that color sensation depends on the laterality. The results indicate the possibility that the deficit in left medial parietal lobe influences multisensory integration between visual and tactile modality, and elicits the synesthetic sensation of colors from tactile stimulation.

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Naming, sentence production, and narrative in patients with mesial temporal lobe epilepsy

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Background and aims: Despite significant literature showing impaired naming difficulty in patients with temporal lobe epilepsy (TLE), there is very limited research on sentence and discourse production. In this study, we investigate the language-production abilities of mesial TLE (m-TLE) patients and discuss the factors that influence these abilities.

Method: Eight m-TLE patients (7 males, 1 female; 19–69 years old; left-TLE 5, right-TLE 3; duration: 7–51 years; hippocampal atrophy 4, amygdala enlargement 4) participated in this study. Aphasia quotient of Western Aphasia Battery (WAB) was 89.9–99.0. Neuropsychological examinations,

including Wechsler Adult Intelligence Scale – third Edition, Wechsler Memory Scale-Revised, and Raven Coloured Progressive Matrix, were conducted. A series of language batteries was administered: at word level, the Test of Lexical Processing in Aphasia (naming of 200 words); at sentence level, the Sentence-Forming Test (composing sentences using two presented nouns, verbs, conjunctions, etc.); and at discourse level, WAB description of a picnic scene and a cartoon explanation of the Standard Language Test of Aphasia.

Results: Five patients presented language deficits at word level, 4 at sentence level, and 3 at discourse level. Three patients (cases 1, 2, and 7) failed at the cartoon explanation due to paraphasia (cases 1 and 2) and omission of necessary words (case 7). Cases 1 and 7 had naming difficulties, cases 1 and 2 had sentence production deficits, and cases 2 and 7 used fewer cohesive ties. Cases 3 and 5, whose working memories were intact, showed intact performance on sentence and discourse tasks despite naming difficulties.

Conclusions: M-TLE patients in this study presented various types of language deficits. These results suggest the necessity of evaluating language problems not only at the word level, but also at the sentence and discourse levels in this population. Their discourse might be affected negatively by problems at the microlinguistic level and a lack of intersentential cohesion.

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Effects of Asymmetric Elongated Delays of Cerebrovascular Collateral Supply on Cognition in Patients with Unilateral Carotid Artery Stenosis

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Background and aims: The time to maximum of the residue function (TMax) has been employed to identify the penumbra area in acute ischemic stroke. Cognitive impairment in patients with carotid artery stenosis (CAS) has been attributed to chronic cerebral hypoperfusion. However, whether TMax can be applied to identify chronic hypoperfusion is undetermined. The study aimed to define the cerebral hypoperfusion state with a preliminary threshold of TMax in patients with unilateral CAS, and examine whether cognitive impairment can be detected based on this threshold.

Method: The study recruited 50 patients with unilateral CAS and 22 healthy volunteers. Brain MRI and a battery of cognitive tests were performed. The preliminary cutoff of TMax (3 seconds) in the left or right middle cerebral artery (MCA) was derived based on the upper limit of 95% confidence interval of TMax contralateral to the stenosis side in patients with unilateral CAS. According to the preliminary TMax cutoff, all patients were then allocated into three groups: right-delayed group (n=18), left-delayed group (n=12), and non-delayed group (n=20).

Results: No significant interhemispheric differences ($p=0.75$) in the mean TMax of the non-delayed group, but the mean TMax of ipsilateral MCA was significantly longer than that of the contralateral MCA of the Left- and Right-delayed groups ($ps<0.001$). Compared to healthy volunteers, the right-delayed group performed significantly worse on most visuospatial tests ($ps<0.04$), while the performance of the left-delayed group was significantly worse on most verbal tests ($ps<0.05$).

The performance of the non-delayed group on all cognitive domains was similar to that of healthy volunteers ($ps>0.07$).

Conclusions: TMax can be used to differentiate the chronic hypoperfusion state in patients with unilateral CAS. Prolonged TMax delay in the MCA of either hemisphere may lead to lateralized impairment in cognition functions in patients with unilateral CAS.

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The personality changes by removal of the acoustic nerve tumour

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Background and aims: We report a case with acoustic nerve tumor who presented personality change characterized by childish behavior and after surgery his personality change was recovered and his self-awareness was improved.

Participant and Method: The patient was a 56-year-old left-handed man. He had worked as a sales person until ten years ago. Though he had noticed his right ear's loss from 30 years ago, he had ignored until recently. MR images revealed his right acoustic nerve tumor and hydrocephalus. During the neuropsychological examination, he showed personality change. In order to remove the tumor, he was underwent the awake craniotomy. Before, intra and post-operative periods, we observed the patient's attitude and utterance.

Results: Before the surgery, he showed childish behavior and his insight for the disease was very low. But during the awake craniotomy, his self-awareness was improved. Though, after the surgery, his hearing loss and orientation was much deteriorated, his awareness was improved and his childish behavior was significantly diminished. He also noticed his deficits and he said "I got crazy". During interview, the patient said himself that he became a different person after surgery. Also he thought that he was a person with a sunny disposition before surgery.

Conclusions: Fukatsu et al. (1997) reported a case who presented childish behavior and euphoria caused by reduction in the thalamus and the cerebellum. In addition, it has also known that the brainstem plays an important role in thinking self (Deshmukh, 2008). Our patient's pre-operative personality change including childish behavior and euphoria was diminished after the surgery in the acoustic nerve. We think that the removal of the tumor improved reduction of oppression to the cerebellum and brainstem and increased these functions and after that his self-awareness was improved and his childish behavior was reduced.

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Predicting insomnia in people with epilepsy: Exploration of beliefs about sleep and the utility of pre-sleep worry

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Background and aims: Insomnia is highly prevalent in patients with epilepsy (PWE), yet this area remains poorly investigated. This project informs the emerging research on the interplay between sleep and epilepsy by examining how dysfunctional beliefs about sleep (DBAS) and beliefs about the utility of pre-sleep worry (UPSW) influence insomnia severity and quality of life (QOL) in PWE.

Method: One hundred and thirteen participants completed a series of demographic questions and well-validated measures,

including the Dysfunctional Beliefs about Sleep Questionnaire (DBAS-10), Utility of Pre-sleep Worry Questionnaire (UPSWQ), Pittsburgh Sleep Quality Inventory (PSQI) Quality of Life Inventory in Epilepsy (QOLIE-31), Generalized Anxiety Disorder – 7 (GAD-7), and the Neurological Disorders Depression Inventory in Epilepsy (NDDI-E).

Results: 88% of the sample reported scores on the PSQI consistent with presence of insomnia. Hierarchical regression analysis revealed that pre-sleep worry was the only independent predictor of insomnia severity after controlling for anxiety and depression.

Conclusions: The results showed a high incidence of insomnia symptoms, and that insomnia symptom severity was predicted by pre-sleep worry, but not dysfunctional beliefs about sleep. These findings have clinical implications for possible psychological treatment targets for PWE.

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To Nap or Not to Nap: Implications for sleep and memory in adults with epilepsy

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Background and objectives: Adults with epilepsy frequently complain of everyday memory failures. Recent research indicates that napping may provide a protective effect for memory. This is an encouraging outcome for those with epilepsy, however napping has been linked to sleep disturbance in healthy samples and sleep disturbance can exacerbate seizures. This study aimed to explore the effect of napping on memory and sleep disturbance in an epilepsy sample to inform symptom treatment.

Method: Ninety-four subjects from a Sydney epilepsy outpatient clinic completed a self-report questionnaire on napping frequency and duration, memory failures and sleep.

Results: The mean duration of sleep was 7.32± 1.46 hours for the sample and nap frequency averaged 2 naps per week with an average duration of 46 minutes per nap. Pearson's correlations found the level of sleep disturbance and the number of memory failures were not associated with nap frequency or duration. A small positive association was found between sleep disturbance and the number of self-reported memory failures $r(92)=.28, p=.006$.

Conclusions: Our results suggest that greater napping frequency or duration in persons with epilepsy is not associated with memory failure or sleep disturbance. However, higher levels of sleep disturbance did increase the number of memory failures reported and therefore focusing on factors that negatively impact on sleep remain beneficial.

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Relation between functional brain lateralization and pattern of neuropsychological symptoms in stuttering

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Background and aims: Modern neuropsychological data suggests that structural and functional abnormalities in brain lateralization are essential part of syndrome of stuttering (Mock et al., 2012; Foundas et al., 2013). We studied relations between lateral organization of motor and sensory functions and pattern of neuropsychological symptoms in adult persons with stuttering.

Method: 23 subjects with verified diagnosis of stuttering were participated in the study (15 men, age 23.7±5.7). All

subjects participated in complex Lurian neuropsychological testing (Glozman, 2012). The assessment was designed to evaluate the basic cognitive functions: perception, motor functions, speech, memory and neurodynamics component of cognitive activity. The frequency manifestation of the symptoms was calculated for each of these functions and total volume was also computed. Pattern of lateral organization was assessed during testing of Hand, Leg, Ear and Eye laterality (modified from Annett, 1970) and correlation between neuropsychological symptoms and laterality was calculated.

Results: Total volume of neuropsychological symptoms and volume of specific mnemonic symptoms correlates significantly with right-ear dominance ($R=0.36$ and 0.35 , respectively).

Two hypotheses were suggested: (1) Left vector of brain lateralization in audial perception relates to defects in general functioning and, more specific, in mnemonic functions or (2) Right vector relates to compensation of aforementioned defects.

Conclusions: Brain lateralization of audial perception («Ear» test) relates to defects of general functioning and, more specific, memory functions in stuttering. No other specific effects for disturbances of perception, motor functions, speech and neurodynamics component of cognitive activity for «Ear» test and no lateralization effect for any disturbances in «Hand», «Leg» and «Eye» tests were found.

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Detection of inadequate effort using RBANS in patients with psychogenic non-epileptic seizures

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Objectives: The aim of this study is to evaluate cognitive performance and effort in patients diagnosed with PNES using RBANS Effort Index.

Methods: 99 patients with PNES were assessed at least one year after video-EEG monitoring at Na Homolce Hospital. For the purpose of this study, patients were examined using RBANS (Czech research version).

Results: Mean performance was - Immediate memory 89.6 (17.1), Visuospatial/Constructional 85.5 (14.8), Language 96.5 (14.6), Attention 72.7 (18.5), Delayed Memory 84 (18.3) and Total Scale 81.5 (15). Differences in all parameters (except Language) in comparison with norm were significant ($p<.001$). Effort Index was equal or higher than 3 in 21% of patients with PNES.

Conclusions: In accordance with the results of other studies, it is useful to point to a multifactorial approach in the understanding of pathogenesis of PNES. It is essential to assess cognitive status and effort in patients with PNES. In neuropsychology doesn't exist „gold standard“ for the assessment of inadequate effort and malingering of neurocognitive dysfunction. RBANS Effort Index seems to be suitable screening method for detection of inadequate effort in patients with PNES.

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Long-term cognitive outcome after Gamma-Knife surgery of the mesial temporal lobe epilepsy

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Objectives: To assess cognitive performance during the long-term follow-up of patients treated by gamma knife radiosurgery for mesial temporal lobe epilepsy.

Method: Between 1995 and 1999, we treated 14 patients with marginal doses of 24 Gy (n=6) and 18-20 Gy (n= 8). 9 of these were operated for insufficient seizure control. We reviewed cognitive performance in both operated and unoperated patients. We compared Memory Quotients (WMS/WMS-R) and Intelligence Quotients (WAIS-R) before and after interventions. All of them underwent standard preoperative neurological and neuropsychological evaluation.

Results: We found slight, but not significant decline after one year since radiosurgery in intelligence and memory quotients. Attention/concentration got worsened for more than -17 points (p=.03). Two years after radiosurgery there were no significant changes in all quotients. In 8 operated patients we found significant improvement in Global and Visual MQ, mean change was 9.3 and 15.3 points (p< .05), respectively.

Conclusions: Radiosurgery with 25, 20, or 18-Gy marginal dose levels did not lead to cognitive changes (except Attention/concentration domain) but also seizure control. Subsequent epilepsy surgery could stop seizures and also lead to better memory performance. Higher doses were associated with the risk of brain edema, intracranial hypertension, and a temporary increase in seizure frequency.

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Validation of automated hippocampal volumetric measures in a clinical population

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Background and aims: There is a move towards incorporating biomarkers such as hippocampal volumetric measures to assist in the diagnostic process of early Alzheimer's Disease. Current gold standard methods of volumetric analysis are performed using manual segmentation, which is time-consuming in nature and limits its clinical utility. It is therefore of practical interest to validate automated segmentation algorithms to overcome some of the limitations of manual methods. The main aim of this study is to compare volumes generated by an automated hippocampal segmentation technique against manually traced measurements on MRI scans in a clinical population.

Method: 1.5T MRI scans were obtained from twenty nine subjects (age=64.2±9.8) from a memory clinic at St Vincent's Hospital Melbourne. Hippocampal volumes of these subjects were measured using Analyze 12.0 software (BIR, Rochester MN) by manual boundary tracing of contiguous slices and obtained automated methods using FreeSurfer 5.3.

Results: Paired sample t-test showed that FreeSurfer volumes were significantly larger than manual measurements for both rater 1 (t=5.15, df=28, two-tailed p<.001) and rater 2 (t=9.63, df=28, two-tailed p<.001). Bland-Altman plot suggests this inflation in volume is consistent across scans. There was high correlation of FreeSurfer values with manual segmentations of both rater 1 (r_s = .80, p<.001) and rater 2 (r_s = .82, p<.001).

Conclusions: Overall, FreeSurfer demonstrated robustness in measuring varying degrees of atrophy in clinical scans, with consistent values and good correlation with manual measures.

The findings suggest considerable potential utility of FreeSurfer software in the clinical setting.

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Multisensory treatment techniques in facilitating flaccid upper extremity recovery in subacute stroke patients: a pilot study

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Aim: This project evaluated the effectiveness of multisensory treatment techniques for ischaemic stroke type of patients during outpatient rehabilitation.

Method: Eighteen subacute patients with stroke, presenting with flaccid upper extremity were recruited and randomly allocated into three groups in running weekly 2-session, 12-week training programs respectively: multisensory treatment techniques group, mirror therapy training group, and conventional training group. Manual Muscle Test (MMT), Brunnstrom stage, Fugl-Meyer assessment, and the Hong Kong version of Modified Barthel Index (MBI) were used as outcome indicators and conducted during pre- and post-treatment period.

Results: The multisensory treatment techniques group and mirror therapy group showed significant improvement in the outcome indicators than the conventional training group (p<0.05). The multisensory treatment technique group showed better improvement than mirror therapy in MMT, Brunnstrom stages and Fugl-Meyer assessment test, and grip strength respectively.

Conclusion: The multisensory treatment techniques is suggested as having facilitation effect to improve flaccid upper extremity function compared to mirror therapy group and conventional methods in terms of gross motor function.

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Walking reduces spatial neglect

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Background and aims: Spatial neglect is a common consequence of stroke. Neglect behaviour is typically exacerbated by increased task demands. It was thus anticipated that the addition of a secondary task requiring general attention (walking) would worsen performance on tests of spatial neglect. Here, however, we report a patient in whom neglect was considerably reduced when performing a visual search task while walking.

Method: SMI Eye Tracking Glasses were employed to track the eye movements of a 55-year old stroke patient with right brain damage. The patient, who displayed marked signs of left-sided neglect in paper-and-pencil measures, performed a visual search task on a computer screen (single-task) and while walking (dual-task). In the dual-task, the patient was required to detect targets placed along the ward corridors while walking a circular course. In order to assess neglect behaviour, an exploratory quotient was calculated by dividing the number of saccades into the right visual field by the number of saccades into the left visual field. Values > 1

indicate more saccades towards the right side, whereas values of 1 suggest a symmetric exploration of the left and right sides of space.

Results: The exploratory quotients for the computer and walking visual search tasks were 123.4 and 2.1, respectively. The walking quotient was thus more than 60 times smaller than the computer quotient. The much smaller quotient indicates a substantial increase of saccades to the right and, consequently, a significant reduction of neglect behaviour in the dual-task relative to the stationary visual search task.

Conclusions: Contrary to expectations, walking reduced symptoms of spatial neglect. Several explanations for why a presumably more taxing task ameliorated neglect will be discussed. For example, this patient may have suffered from left spatial neglect for near but not far space.

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Deep brain stimulation for severe treatment resistant OCD: The initial Australian experience

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Background and Aims: Deep brain stimulation (DBS) can be of benefit in carefully selected patients with severe intractable obsessive-compulsive disorder (OCD). The aim of this paper is to describe the outcomes of the first five DBS procedures for OCD undertaken in Australia.

Method: Following successful application to the Psychosurgery Review Board, patients proceeded to have DBS electrodes implanted in the nucleus accumbens bilaterally. All patients were assessed pre and post operatively, at regular intervals, for a period of at least 10 months. Assessment included comprehensive psychiatric rating evaluation, including symptom rating scales.

Results: Five patients underwent DBS surgery and were followed for at least 10 months (up to 28 months). All patients exhibited improvements as measured by clinical assessment, symptom ratings and self reported functioning. The major adverse events have related to the impact of symptomatic improvement on psychosocial and family structures.

Conclusions: DBS was an effective treatment for OCD in these highly selected patients. DBS provides advantages over lesional psychosurgery but is much more expensive and requires significant multidisciplinary input at all stages, pre and post operatively, ideally within a specialised tertiary clinical / academic centre.

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A case of Gogi (word-meaning) aphasia caused by Multiple Sclerosis

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Background and objectives: Various cognitive deficits and aphasia may develop in multiple sclerosis (MS). We report a patient with definite MS presenting Gogi (word-meaning) aphasia, which generally associated with grey matter lesions in the left anterior temporal lobe.

Case: A 40-year-old female with a 14-year history of primary progressive type of MS presented a language disturbance.

There were severe anomia and defective word comprehension, while syntactic comprehension ability was intact. MR images demonstrated high signal white matter lesions in the bilateral temporal lobes accentuated in the left side on T2-weighted images, the left hemisphere dominant brain atrophy.

Methods: We investigated the patient's semantic systems; 1) the naming and pointing task of 200 object drawings across 10 categories, 2) the lexical decision task presented auditorily or visually, and 3) the test for surface dyslexia, which consist of reading aloud and reading comprehension of 28 Kanji words with special readings.

Results: 1) The patient showed poor comprehension ability of words (69% correct) on the pointing task, and severe naming deficits of objects of all the categories (38.5% correct). 2) On the lexical decision task, her performance was markedly defective, 36/120 correct for the spoken words and 27/120 for the written words. 3) On the test for surface dyslexia, she showed apparent surface dyslexia, 4/28 correct for reading aloud and 12/28 for reading comprehension.

Conclusions: This is, for our best knowledge, the first case of Gogi (word-meaning) aphasia caused by MS. We speculated that the deficits of our patient were in the phonological representation level as well as in the verbal semantic level. The anterior temporal white matter lesions disrupting the network involving verbal semantic memory is responsible for word-meaning aphasia, as well as semantic dementia, where degeneration of the anterior temporal cortices is the central pathological feature.

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Working memory contributions to the WAIS-IV Visual Puzzles subtest

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Background and aims: Block Design (BD) and Visual Puzzles (VP) from the WAIS-IV provide estimates of visuospatial ability. Observations in practice suggest a reliable discrepancy in dementia, such that VP is often lower than BD. This study sought to explore this phenomenon in greater detail.

Method: Records from 106 clinical records (Age: $M = 67.1$, $SD = 11.3$; Education: $M = 14.9$, $SD = 2.6$) seen for neuropsychological evaluation as part of routine care in an outpatient neurodegenerative disorders clinic were reviewed. Measures of interest included WAIS-IV Digit Span (DS), VP, and BD, in addition to the Brief Visuospatial Memory Test, Hopkins Verbal Learning Test, and Judgment of Line Orientation. Pairwise correlations were calculated between cognitive raw scores, controlling for age and education.

Results: Except for DS-Forward ($r = .177$; $p = .079$), VP demonstrated significant positive correlations with all variables ($p < .05$); BD demonstrated a similar pattern, though the correlation with HVLT Trial 1 was also non-significant ($r = .148$; $p = .106$). The correlation between VP and DS-Backward ($r = 0.41$; $p < .001$) was larger than the correlation between BD and DS-Backward ($r = .26$; $p < .05$); this difference was statistically significant ($z = 1.78$; $p < .05$). Correlations between DS-Sequencing and VP ($r = .37$; $p < .001$) and BD ($r = .30$; $p < .001$) were not statistically different, though the pattern was similar.

Conclusions: Both VP and BD are clearly measures of visuospatial functioning, however, the obtained results suggest that VP may have greater working memory demands.

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The right stuff: Hippocampal asymmetry and cognitive decline in Type 2 diabetes

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Background and aims: Type 2 diabetes is associated with an increased risk of developing cognitive impairment and dementia. While the causal pathway from diabetes to dementia is unknown, cross-sectional research indicates the process is at least partially mediated by hippocampal atrophy. This study aimed to identify neurocognitive and hippocampal indicators of longitudinal decline on the Clinical Dementia Rating (CDR) scale, in older adults with Type 2 diabetes.

Method: Neurocognitive testing ($n=132$) and magnetic resonance imaging (MRI; $n=120$) was undertaken by dementia free adults (CDR 0 or 0.5) aged 62 to 91 years, with Type 2 diabetes. The CDR was administered on two occasions, 17.9±2.9 months apart ($n=117$). Group comparisons of neurocognitive performance and hippocampal measures were conducted between participants whose CDR score declined (CDR-d; $n=11$, 9.4%), improved (CDR-i; $n=14$, 12%), or remained stable (CDR-s; $n=92$, 78.6%) over an 18 month period. Significant results were then entered into a predictive model of clinically-rated decline, using binary logistic regression.

Results: The CDR-d group had smaller right hippocampal volume ($p=.001$) and greater hippocampal asymmetry ($p<.001$) than CDR-i and CDR-s. Speed of attention ($p<.001$), memory retrieval speed ($p=.001$), and semantic fluency performance ($p=.009$) was also significantly poorer in the CDR-d group. Left > right hippocampal asymmetry was associated with an increased likelihood of decline in CDR score 18 months later. Neurocognitive differences were not significant independent predictors of subsequent CDR decline.

Conclusions: The findings suggest right hippocampal pathology, resulting in greater hippocampal asymmetry, is important in the pathogenesis of cognitive impairment in Type 2 diabetes. In addition, neurocognitive and hippocampal abnormalities may be present up to 18 months before a decline on the CDR.

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The Use of the Attention Network Test (ANT) in Clinical Practice

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Background and Objectives: The Attention Network Test (ANT, Fan et al., 2002) is a freely downloadable computerized test of attention which has been validated with functional imaging and genetic studies (Peterson and Posner, 2012). Its development was based on a theory of subtypes of attention, including alerting, orienting, and executive functions (Posner and Peterson, 1990) as well as the brain structures/networks and neurotransmitters that subserve them.

While developed as a research tool (and has been used in more than 30 published studies since its development in 2002), its clinical utility has been neglected. This may in part be due to the absence of a consolidated normative database. In this study we examine methodological and data analysis differences across studies, and summarize major findings for various clinical groups.

Method: Data for 94 healthy college students was collected. Additionally, a literature search of Medline, PsychInfo, and PubMed was conducted for studies using attention, alerting, orienting, executive network and attention network as search terms. Theoretical predictions for different populations based on the underlying attentional theory were also examined.

Results: Studies were found to differ in terms of administration and analysis. Results for different clinically relevant populations (major depressive disorder, schizophrenia, ADHD, and the elderly, etc.) and healthy controls are reported, taking these differences into account.

Conclusion: The ANT is a useful and accessible tool for assessing and making predictions that have important treatment implications. Thus the ANT provides information not typically available from commercially available tests of attention.

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Neuroanatomy of common factors for cognitive tasks and its function: a study of voxel-based lesion-symptom mapping

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Background and aims: The aim of this study was to evaluate changes of cognitive function of glioma patients from pre-operation to 6 months after surgery and identify common cognitive factor affecting cognitive tasks and its related brain areas.

Method: 49 glioma patients participated (25 in the left, and 24 in the right hemisphere, mean age=39.5). Cognitive function was measured as the difference between performance of pre-operative stage, and that of 1 month after, and 6 months after a resective surgery. Six cognitive tasks were administered: Visual verbal learning task, Digit span (forward, backward) task, Letter-digit substitution task, Verbal fluency task, Stroop color-word task, and Concept shifting task. A Factorial analysis was performed to their behavioural performance of the tasks, then examined the neural correlates for the extracted factors using voxel-based lesion mapping method.

Results: Behavioural performance of Visual verbal learning task, Digit span task (forward), Verbal fluency task, and Letter-digit substitution tasks at 6 months after a resective surgery were deteriorated compared with those of pre-operation stage. A factorial analysis revealed three main factors suggesting memory function, regulating information function, and interference function. Our anatomical voxel-based lesion-symptom mapping analysis related to these three components showed the hippocampus/globus pallidus component, hippocampus/globus pallidus and medial prefrontal cortex component and lateral prefrontal cortex component.

Conclusions: Our results suggested common cognitive components and its related brain areas affecting different cognitive tasks.

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A case report of the interventions for simultanagnosia and unilateral spatial neglect: Using the task of integration of somatosensory, vision and language

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Background and aims: The purpose of this case report is to describe the outcome of interventions for a patient who presented simultanagnosia and unilateral spatial neglect (USN). The interventions were performed to integrate somatosensory with confused both vision and language.

Method: The patient was a 50-year-old and right-handed woman with cerebral hemorrhage in the left occipital and parietal cortex and subcortical white matter. She was two months poststroke and presented little motor paralysis and somatosensory deficit. Due to simultanagnosia, she had difficulty in finding multiple objects under her eyes at once, which was remarkable when she tried to find objects consciously and voluntarily in her unfamiliar spaces and her right visuospatial. On behavioral inattention test (BIT), she scored 96 points (cut-off = 199). Her speech was fluency, but sometimes she confused right and left, up and down. She had the integration tasks with the two strategies for three weeks. Firstly, she was requested to reach her hand passively towards a board that was divided into nine (3x3) with closed eyes, and she was questioned which divisions she touched, then she collated it visually. Secondly, she was requested to describe the positions where she touched in the entire board (e.g. the top and left).

Results: The patient was able to visual search of objects in various spaces. On BIT, she scored 201 points.

Conclusion: The integration of multiple modalities has a possibility to show the effectiveness to patients with simultanagnosia and USN in improving the visual searching.

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How confident are you to use technology with your clients?

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Background & aims: Occupational therapy rehabilitation maximises independence after traumatic brain injury (TBI). Prior research has demonstrated that using technology with TBI survivors can increase their independence. This idea is still the focus of much research and some suggest that Occupational Therapist's working within the TBI population are well placed to put this research into practice. Yet, the reality is that many Occupational Therapists do not prescribe technology as an intervention. We aim to explore opinions of Australian Occupational Therapist's regarding the use of technology as a compensatory strategy within the TBI population.

Method: This qualitative research is currently underway. Two focus groups will be completed. One with clinicians involved in a research project exploring the use of Google Calendar (free mainstream electronic calendar) to increase TBI survivors' independence and one with clinicians from the broader neurorehabilitation network in Melbourne.

Results: The focus groups will occur in April 2015 post completion of Google Calendar study. It is anticipated that

transcription analysis will identify common strengths and barriers to using technology. These will be compared and contrasted against international findings that the cost, lack of technical support and therapist confidence are barriers to using technology in practice.

Conclusions: Findings are expected to provide important information about how to best support occupational therapists to prescribe and teach use of technology as compensatory strategies, with recommendations being clinically useful for other health professions working with adults after TBI.

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Characterising cortical inhibition in premanifest and symptomatic Huntington's disease using transcranial magnetic stimulation

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Background and aims: The cerebral cortex is involved early in the disease process in Huntington's disease (HD), however cortical physiological properties have not been well characterised. This study used transcranial magnetic stimulation (TMS), with a paired-pulse paradigm, to assess short- and long-interval cortical inhibition (SICI and LICI, respectively) in eleven individuals with early symptomatic HD (symp-HD; mean age = 55.6 years), fifteen individuals with premanifest HD (pre-HD; mean age = 41.3 years), and fourteen healthy controls (mean age = 41.7 years).

Method: Following TMS to the left motor cortex, electromyographic (EMG) responses were recorded from the right abductor pollicis brevis muscle at rest. Amplitudes of motor-evoked potentials (MEPs), after paired-pulse stimulation, were compared to MEPs elicited by single pulses, and the degree of inhibition was calculated.

Results: Symp-HD individuals had significantly reduced SICI compared with pre-HD and controls, whereas pre-HD did not differ from controls. However, resting motor threshold and LICI were not significantly different between groups. In symp-HD individuals, higher CAG repeat length and disease burden score (DBS) were associated with reduced cortical inhibition, whereas in pre-HD, higher CAG and DBS were associated with increased inhibition.

Conclusions: These findings suggest that cortical inhibition remains broadly unaffected during the premanifest stages of HD, despite wide-ranging neurodegeneration in cortico-subcortical pathways. However, early cortical physiological changes may be reflective of compensatory processes during the premanifest stages, especially in individuals with a higher genetic load. Neurophysiological abnormalities observed in symp-HD participants, which are supportive of findings from previous research, might result from failure of these compensatory processes. Our preliminary data suggest that a combination of TMS-EMG measures may have greater utility for further understanding pathophysiological changes during disease progression in HD.

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Brain volume loss and neuropsychological performance in HIV+ subjects

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Background and aims: HIV directly invades the brain resulting in cognitive decline, cortical and subcortical pathological changes. Nevertheless, anti-viral treatments may protect the brain from HIV-related neurodegeneration. The study aimed to examine the effects of HIV on cognitive functions and brain volume in patients undergoing HAART.

Method: Preliminary results were obtained from 22 HIV+ MSM men and 14 HIV- demographically matched controls. All HIV+ participants had viral load <40 copies/mL and CD4 cell count >450 cells/mm³. All subjects scored above 27 points in MMSE. Neurocognitive measures included: tests of complex attention and executive functioning (WCST, CTT, RFFT), memory and learning (Corsi's blocks, CVLT), psychomotor skills (GPT), depression (CES-D). The global grey matter, white matter and total brain volume were estimated using the VBM8 toolbox (<http://dbm.neuro.uni-jena.de/vbm/>) derived from T1 weighted 3 T MRI. The correlation analyses were performed to assess the relationship between grey matter, white matter and total brain volume and the following medical factors: the lowest value of CD4+; CD4+ count during study participation; years since HIV detection, the highest value of viral load and viral load during participation.

Results: The groups did not differ in depression (CES-D), executive functions (WCST, CTT), verbal memory and learning (CVLT) or motor speed (GPT) ($p>0.05$). Slight differences were observed only in visual memory span (Corsi's blocks) and nonverbal fluency (RFFT). HIV+ patients had smaller grey matter, white matter and total brain volume ($p<0.05$). The total grey volume showed a significant negative correlation with age in the whole studied group as well as in each sub-group. Significant negative correlation was seen between grey matter volume and the number of years from HIV detection.

Conclusions: HIV+ patients undergoing HAART did not show generalized cognitive decline, despite demonstrating grey matter volume loss in comparison to control subjects. It suggests that HIV+ patients may compensate cortical thinning. This issue deserves further studies.

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The syllabic structure distribution of Spanish is reflected in the phonological errors of aphasic patients

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Background and aims: It is well known that the phonological system of each language is reflected in manifestations of aphasia. In the Spanish language, the syllable structure is a well-defined unit as just three syllabic structures represent 80.13% of all syllables: CV (51.35%), CVC (18.03%) and V (10.75%). Our aim was to whether the syllable structure distribution in Spanish has an effect on phonological errors committed by Spanish-speaking aphasics.

Method: Twenty-four Spanish-speaking aphasic patients with different etiologies, aphasia type, and severity, performed a repetition task with 61 words and 65 pseudowords containing

the 8 most frequent syllabic structures in Spanish as targets, in three different positions: initial, middle and final. For each target syllable we analyzed the erroneous syllabic structure produced by patients.

Results: A total of 399 syllable transformations were obtained for the target syllables. There was a strong, significant correlation between the erroneous syllabic structures selected by patients and Spanish syllabic structure distribution ($r=.94$ $p<.01$ for words; $r=.94$ $p<.01$ for pseudowords). For example, in word repetition, the syllabic structures CV, CVC and V, constituted 43%, 25% and 13%, respectively, of the erroneous structures produced.

Conclusions: The characteristics of the syllable structures in the erroneous emissions was proportional to the Spanish syllabic structure distribution, suggesting that the phonological system is evidenced in the phonological errors committed by aphasic patients. These findings could have clinical implications in terms of the selection of diagnostic and rehabilitation materials and procedures for aphasic patients.

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Sustained unilateral hand clench alters frontal cortical oxygenated hemoglobin and anxiety

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Background and aims: Anxiety is associated with traumatic brain injury (TBI). Methods to ameliorate anxiety, and which could be incorporated into daily living, would benefit TBI patients' life quality. Reduction of right, or increased left, hemisphere activity is associated with decreased anxiety. Sustained unilateral motor movements (SUMM) with the hand may alter hemispheric activity beyond motor areas, spreading into frontal areas known to mediate emotion. The present work examined whether SUMM i) increases cortical frontal activity and ii) alters anxiety.

Method: Measures: Functional Near-Infrared Spectroscopy recording and Brief Mood Introspection Scale. Procedure: baseline, followed by two sets of 45 s left versus right hand SUMM (between-subjects), followed by post-clench recording and emotion assessment. **Results:** 20 seconds post left hand SUMM ($n=7$ strongly-right-handed men) compared to 30 seconds of baseline: increased left ($t(6)=2.68$, $p<.05$), but not right hemisphere ($p=.08$) frontal oxygenated hemoglobin (oHb). 20 seconds post right hand SUMM ($n=7$ strongly-right-handed men) compared to baseline: increased left ($t(6)=2.49$, $p<.05$), and right hemisphere ($t(6)=3.24$)= $p<.05$) oHb. Following left hand SUMM, left hemisphere oHb was trending greater relative to right hemisphere ($t(6)=2.29$, $p=.06$). Following right SUMM, right hemisphere oHb was greater than left hemisphere oHb ($t(6)=3.45$, $p<.05$). Relative to baseline, left hand SUMM increased nervousness ($t(6)=3.33$), $p<.05$), while right SUMM did not.

Conclusions: Relationships between oHb and anxiety following SUMM are not as straight-forward as expected. Regardless, SUMM can alter oHb and anxiety, and future research should examine SUMM in the context of anxiety reduction for TBI.

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Clinical and therapeutic applications of repeated transcranial magnetic stimulation (rTMS) of the dorsolateral prefrontal cortex (DLPFC) in patients with Parkinson's disease

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Background and aims: The most common cognitive deficit in affected individuals is executive dysfunction. Fluctuations in attention and slowed processing speed are among other cognitive difficulties. Frequent mood difficulties in PD are depression, apathy and anxiety. Antidepressant medication often fails to give the patients the desired beneficial effect. Recent studies confirmed that high-frequency rTMS (5-20 Hz) delivered to the left DLPFC for 2-4 weeks was able to produce potent antidepressant, anxiolytic and cognitive effects in PD patients while being functionally equivalent to pharmacological treatment with fluoxetine. The mechanisms and long-term consequences of the described effect are yet to be fully elucidated.

Methods: The study will recruit patients with a dual diagnosis of PD and moderate to severe depression with at least 2 non-effective AD trials in the recent past. Patients are randomized and assembled into one of two groups: Group A receives TMS for two stimulation blocks, Group B has a Sham condition instead of the first stimulation sequence. Behavioral domains to be assessed include cognition, mood, motor function, activities of daily living (ADL) and quality of life (QoL). Assessments shall be performed at baseline and after the 3rd, 6th, 12th and the 18th week. Ethical approvals have recently been received from East Tallinn Central Hospital and University of Tartu human medical research ethics committees.

Results: We hypothesize that the beneficial effects of rTMS on cognition, mood and motor function (in the short- and long-term) and subsequently ADL and QoL (in the long term) shall be significantly greater in the TMS group compared to the Sham group.

Conclusions: There is basis to apply rTMS via DLPFC in PD for the objective of alleviating non-motor symptoms in treatment-resistant depression.

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Pathophysiology of Opioid Dependence

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Background and Aims: The poor state of physical and mental health of many opiate dependent patients is well known to GP's. This is not congruent with the generally benign view of long term opioid dependency (OD) which is often promulgated. **Aim:** Improved Understanding of OD and clinical treatments.

Method: Comparisons between general medical and OD patients.

Results: We have shown worse dental health, lower circulating stem cells, higher rates of cervical neoplasia, increased hair greying, alterations in hypothalamic-pituitary-peripheral axes, an advancement of cardiovascular age and others have found lower rates of telomerase all of which are consistent with an acceleration of aging, some of which were reversed by antagonist / abstinence treatment. Differences in time- and age- dependent serum anions have also been shown consistent with anomalous behaviour of the mesolimbic and peripheral GABAergic substrate of dependency. Many of these changes are worse in females suggesting that the profile of pathophysiological presentations is sexually divergent. Opioids directly bind the endotoxin receptor TLR4 (Toll-Like Receptor 4). Recurrent themes in these studies are stem cell

impairments, immune and glial stimulation, their interaction, drug induced plasticity, and prominent interactions between various drugs of abuse and endogenous signalling pathways.

Conclusion: These findings are consistent with the activation of major hormonal and intracellular stress signalling pathways (cAMP/cGMP, Jun-Fos, NF-κB, Protein-Kinase-C – PhosphoInositol-3-Kinase, MAP (Mitogen Activated Protein) kinase) and altered regulation of transcription and epigenetic changes via cyclin dependent kinase 5, CREB/CBP (cAMP-Response-Element-Binding-Protein / CREB-Binding-Protein / P300), NF-κB, Calci-calmodulin Kinase II and mTOR (Mammalian-Target-Of-Rapamycin) which have been and are increasingly being described.

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Assessment of Confabulation in Patients With Alcohol-Related Cognitive Disorders: The Nijmegen-Venray Confabulation List (NVCL-20)

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Background and aims: Even though the first awareness of confabulations is often based on observations, only questionnaires and structured interviews quantifying provoked confabulations are available. So far, no tools have been developed to measure spontaneous confabulation. This study describes and validate an observation scale for quantifying confabulations, including spontaneous confabulations, in clinical practice.

Method: An observation scale consisting of 20 items was developed, the Nijmegen-Venray Confabulation List-20 (NVCL-20). This scale covers spontaneous confabulation, provoked confabulation, and memory and orientation. Professional caregivers completed the NVCL-20 for 28 Korsakoff (KS) patients and 24 cognitively impaired chronic alcoholics (ALC). Their ratings were related to the Dalla Barba Confabulation Battery (DBCBA), Provoked Confabulation Test (PCT), and standard neuropsychological tests.

Results: The categories of the NVCL-20 have 'good' to 'excellent' internal consistency and inter-rater agreement. The KS confabulated more (spontaneously and provoked), and more problems in memory and orientation were observed. Correlations with neurological test scores showed that confabulations were associated with memory deficits, but not with intrusions and executive dysfunction on the tests used in this study.

Conclusions: The NVCL-20 is the first instrument that includes items addressing spontaneous confabulation. Administration is reliable, valid and feasible in clinical practice, making it an useful addition to existing confabulating measures.

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Confabulation and intrusions: two sides of the same coin?

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Background and aims: Total numbers of intrusions on verbal memory tests, such as the California Verbal Learning Test (CVLT), are often used as an index for confabulation behavior. However, a clear relationship between confabulation behavior and intrusions has yet to be established. We examined whether different types of intrusions and aspects of confabulation behavior are related. Furthermore, we aimed to shed light on the underlying neuropsychological processes associated with intrusions by examining whether patients with Korsakoff's syndrome (KS) produce *different types* rather than merely *more* intrusions compared to healthy individuals. **Method:** The CVLT and a confabulation observation scale, the Nijmegen-Venray Confabulation List-20 (NVCL-20) were administered in KS, cognitively impaired alcoholics and healthy controls. Three types of intrusions on the CVLT recall condition were distinguished: Unrelated, semantic, and retroactive interference. The total number of intrusions was also computed.

Results: This paragraph contains preliminary results. Significant, positive correlations were only found between unrelated intrusions and confabulation scores of the NVCL-20 in KS. The intrusion patterns of KS and healthy controls were not significantly different, with a marginally significant tendency to produce more semantic intrusions compared to other intrusion types.

Conclusions: With the results so far, it appears that not all types of intrusions, or the total number, may be used as an index for confabulation behavior. The performance of KS appears to be a "worsening" of the performance of healthy individuals. The marginal trend to produce more semantic intrusions hints towards a tendency of both groups to rely on gist-based processes.

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Neuropsychological assessment is possible and effective in acute brain tumours

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Background and aims: Neuropsychological assessment of brain tumours in the acute post-surgical stage rarely occurs. Possible reasons for this are (1) cognitive deficits in brain tumours have been thought to be mild and nonspecific and (2) detailed cognitive evaluation can be difficult in acute stages of recovery, particularly if tumours progress or treatment is ongoing. Cognitive screening tools have become popular for detecting cognitive deficits in acute stages; however, their sensitivity to cognitive impairment may be limited. This study investigated the sensitivity of a cognitive screening tool, the Montreal Cognitive Assessment (MoCA), compared to a brief but tailored cognitive assessment for identifying cognitive deficits in acute primary brain tumours (i.e., low/high grade gliomas, meningiomas).

Method: Brain tumour patients completed the MoCA and brief cognitive assessment in the same week. The cognitive assessment targeted the domains of fluid intelligence and abstraction, verbal/visual memory, language, visual perception, attention and executive function. Performance was compared on broad measures of impairment: a) number of patients impaired on the global screening measure or in any cognitive domain; and b) number of cognitive domains impaired and specific analyses of MoCA-Intact and MoCA-Impaired patients on specific cognitive tests.

Results: Only 30% of patients were impaired on the MoCA, compared to 70% of patients being impaired in at least one domain on the cognitive assessment. Overall, the MoCA-

Impaired group obtained lower naming and word fluency scores than the MoCA-Intact group, but otherwise performed comparably on cognitive tests.

Conclusion: Our results demonstrate that the MoCA has poor sensitivity for detecting cognitive impairments in acute brain tumour patients and that a brief but tailored cognitive assessment is necessary. These findings have implications for clinical management and planning, as well as specific considerations for neuropsychological assessment.

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The relationship between perceived cognitive deficits in Persons with Multiple Sclerosis and Caregiver burden

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Background: Multiple Sclerosis (MS) is a chronic neurological condition which can have a profound impact not only on the person with the condition but also those people in their lived. During the disease trajectory the person with MS (PwMS) may experience varied symptomology affecting their physical, cognitive, behavioural and psychological functioning.

Aim: To explore whether discrepancies exist between ratings of memory and neurobehavioural functioning from both the PwMS and their caregivers, and furthermore whether these discrepancies have a relationship to caregiver burden.

Method: 30 dyads (PwMS and their caregiver) took part in the study. PwMS rated their memory and neurobehavioural functioning using the Memory Awareness Rating Scale (MARS) and the Frontal System Behavioural Scale (FrSBe). Caregivers rated the PwMS' functioning using the informants' versions of these scales and their level of caregiver burden using the Burden Interview (BI). Discrepancy scores were calculated by subtracting PwMS' scores from their caregivers' scores on the MARS and FrSBe and this was then compared with the scores elicited from the BI

Results: No significant differences were found between how PwMS rated their memory and neurobehavioural functioning compared to their caregivers. Discrepancies between ratings of neurobehavioural functioning in dyads were found to be related to caregiver burden, although discrepancies between ratings of memory functioning were not.

Conclusions: The relationship between caregiver burden and a PwMS' cognitive and behavioural functioning is greater when a PwMS rates their neurobehavioural functioning to be less impaired than their caregiver. Given the small sample size further research needs to be conducted to consider which factors are most predictive of caregiver burden in order to identify the caregivers most at risk of decreased wellbeing and to devise appropriate interventions.

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The case of category specific anomia during awake surgery in the right frontal lobe

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Background and aims: Previous studies have shown that there are several types of categorical specific anomia, such as persons, animals, tools, and body parts. It is known that the responsible lesion for other than body parts have been specified, but the lesion for body parts naming is under debate. We report a case of awake craniotomy who could not name body parts during the surgery in the right frontal lesion.

Method: A patient was a right-handed 70 year-old female suffering from a brain tumor in the right frontal lobe. She had paralysis in her left side but had no aphasia. In order to remove the tumor, she underwent awake craniotomy.

Results: During awake craniotomy, neuropsychologists examined her naming ability. She scored 96% correct in the picture-naming test except for body parts. In the tactile naming tasks, she showed correct response. About two hours left, her accuracy for naming was slightly disturbed only for body parts (75%). After 40 minutes later, her body parts naming was much declined (25%) and slightly recovered after an hour (50%). Despite she could not name a picture of ear, thirty minutes after the presentation she spontaneously "I remembered. It's a ear." When she was presented a nose picture and the correct answer, she denied the correct name. During the surgery, there is no noticeable change of motor and sensory function. Her left hemispatial neglect (6% deviation from center position) was observed only when two hours past from her awake.

Conclusions: The right frontal lobe lesion induces transient body parts anomia and our result implies that the right frontal lobe might be responsible for category specific naming; however, it remains possibilities that our patient suffered from visual agnosia or hemispatial neglect. Because she showed denial for the correct answer and showed slightly neglect during the surgery.

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Evaluation of a newly developed measure of theory of mind: The Virtual Assessment of Mentalising Ability
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Background and aims: This study examined the reliability and validity of the Virtual Assessment of Mentalising Ability (VAMA).

Method: The VAMA consists of 12 video clips depicting a social drama imposed within an interactive virtual environment with questions assessing the mental states of virtual friends. Response options capture the continuum of Theory of Mind (ToM) ability (i.e., impaired, reduced, accurate and hypermentalising) and first and second order cognitive and affective ToM. Sixty-two healthy participants were administered the VAMA, three other ToM measures, and additional measures of neurocognitive abilities and social functioning. **Results:** The VAMA had sound internal consistency and high test-retest reliability. Significant correlations between performance on the VAMA and other ToM measures provided evidence of convergent validity. Further, the VAMA was correlated with indices of social functioning and was rated as more immersive, more reflective of everyday ToM processes, and was afforded a higher recommendation than an existing computer-based ToM task (viz., the Yoni Task).

Conclusions: These preliminary results suggest that the VAMA is an ecologically valid tool that is sensitive to the spread of ability that can occur in ToM subprocesses and may be a valuable addition to existing ToM measures. Future research should explore the validity and utility of the VAMA in clinical and brain-injured populations.

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The Presence of Executive Deficits in Patients with Obstructive Sleep Apnoea

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Background and aims: Obstructive sleep apnoea (OSA) is a chronic condition in which the upper airways collapses during sleep, completely or partially obstructing breathing. The condition is associated with intermittent hypoxia and severe sleep fragmentation which disrupt the restorative functions of sleep. This has been evidenced through neuropsychological tests of executive function, structural and functional neuroimaging, and cerebrospinal fluid biomarkers. Despite this evidence of damage, little research has been done to explore the nature of subjective complaint associated with OSA and its impact on activities of daily living. This study examined self-reported executive function in a representative sample of patients with OSA.

Method: 127 participants, who took part in a routine polysomnography investigation which confirmed the presence of OSA, completed a demographic questionnaire, the dysexecutive questionnaire (DEX) a subtest of the Behavioural Assessment of Dysexecutive Syndrome (BADS) and the Cognitive Failures Questionnaire (CFQ) on the evening of their sleep study.

Results: On the DEX, participants scored 18.6 (12.4) and the 30.0 (15.3) for the CFQ. An exploratory factor analysis was conducted. On the basis of scree plots, overall eigen and item loading values, factor structures of four (DEX) and five factors (CFQ) were found to be the most parsimonious.

Conclusions: Factor structures obtained were comprised of logical item groupings and all showed high Cronbach's alpha scores. The results of this study add to the body of evidence for the presence of executive deficits resulting from chronic low-level brain damage in individuals with OSA.

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Adolescents' Performance on the Hayling Task: Developmental Trends in Verbal Response Initiation

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Background and aims: Neuropsychological studies have shown differences in performance on inhibition tasks across age groups, and neuroimaging studies have highlighted increasing maturation into early adulthood of the frontal networks responsible for inhibitory control. This study is the first to report developmentally sensitive response time and error data from children and adolescents on the Hayling Task.

Method: Participants aged 11 to 17, split into four age groups, and were tested on both sections of the Hayling Task.

Results: Results demonstrated that the younger participants performed worse than their older counterparts on Section 1, verbal response initiation, whereas performance was stable across the age groups on Section 2, verbal inhibition. Inspection of errors on Section 1 showed age-related differences in language usage.

Conclusions: These results indicate that although the Hayling Task appears suitable for use with adolescent populations, there may be a developmental trend in verbal response initiation at the younger end of the spectrum.

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Construct Validation of the Indonesian Wechsler Adult Intelligence Scale - Fourth Edition (WAIS-IV-IDN)

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Background and aims: The WAIS-IV-IDN has just been developed. In this study, we tried to explore the construct validity then confirm the factor structure of the scale in adult sample. We presented the results of the exploratory and confirmatory factor analysis.

Method: This study consists of 1091 participants. Of the participants; 56.64% were female, with age 16 - 69 (M=32.58, SD=14.80), and among them 51.69% completed senior high school. Exploratory factor analysis (EFA) was performed for 15 subtests with principal axis factoring extraction method and promax rotation method. Then we continued with the confirmatory factor analysis (CFA) with measurement model of three factors as we got from EFA and four factors as described in WAIS-IV (US version) technical manual.

Results: The EFA produced three components (eigen value >1) with the variance that explained by the first (general) factor (40.37% out of 56.74%) in the initial solution compare to if we asked for four factors (40.37% out of 62.58%). The three components named Perceptual Reasoning, Verbal Comprehension, and Working Memory. The CFA result supported for the four factors model ($\chi^2/df = 4.93$, RMSEA = .06, CFI = .98, AIC = 489.12, GFI = .95) rather than the three factors model ($\chi^2/df = 6.11$, RMSEA = .07, CFI = .97, AIC = 593.24, GFI = .94).

Conclusions: The factor structure of the WAIS-IV-IDN support for four factors model as in the technical manual (US version). WAIS-IV-IDN supports for indexes scores and the full IQ score.

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Factor Structure of the Indonesian Wechsler Adult Intelligence Scale - Fourth Edition (WAIS-IV-IDN) for Elderly

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Background and aims: The structural validity is a necessary condition to prove internal validity beside the substantive of the scale. In this study, we examined the factor structure of WAIS-IV-IDN in elderly. Here we present the results of the exploratory and confirmatory factor analysis.

Method: This study consists of 115 participants to determine the construct validity of the WAIS-IV-IDN in elderly. Of the participants; 72.2% were female, with age 70 - 90 (M=76.12, SD=4.9), and were 33.9% completed senior high school. Exploratory factor analysis (EFA) was performed for 12 subtests with principal axis factoring extraction method and promax rotation method. Then continued with the confirmatory factor analysis (CFA) with measurement model of one factor and two factors.

Results: The EFA produced two factors with the variance that explained by the first (general) factor (56.81% out of 65.96%)

in the initial solution. The first factor consists of non-verbal subtests and the second factor consists of verbal subtests. The two factors model is not supported in the CFA ($\chi^2/df = 1.81$, RMSEA = .08, CFI = .98, AIC = 146.24, GFI = .88). However, the CFA result supported for the one factor model ($\chi^2/df = 1.38$, RMSEA = .06, CFI = .99, AIC = 124.4, GFI = .91).

Conclusions: The factor structure of the WAIS-IV-IDN in elderly support for one factor model. WAIS-IV-IDN is a single construct and support the full IQ score but not for indexes scores.

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Functional connectivity associated with hand shape generation: Implications for apraxia

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Background and aims: Clinical research suggests that imitating meaningless hand postures and pantomiming tool-related hand shapes rely on different neuroanatomic substrates. We aim to test the neural response of imitating non goal-directed and the pantomiming of goal-directed gestures in healthy volunteers.

Method: We investigated the BOLD responses to different tasks of hand posture generation in 14 right handed volunteers undergoing fMRI. Conjunction and contrast analyses were applied to select regions that were either common or sensitive to imitation and/or pantomime tasks. Correlations of the hemodynamic response in these regions were calculated to detail its functional connectivity.

Results: The network engaged during hand shape generation tasks included bilateral areas of medial and lateral extrastriate cortex, superior and inferior regions of the lateral and medial parietal lobe, primary motor and somatosensory cortex, and left dorsolateral prefrontal, and ventral and dorsal premotor cortices. Functional connectivity analysis revealed that during hand shape generation the BOLD-response of every region correlated significantly with every other area regardless of the hand posture task performed, although some regions appeared to be more involved in some hand postures tasks than others. Based on differences in the functional connectivity between tasks we predict that imitation of novel hand postures would suffer most from left superior parietal disruption and that pantomiming hand postures for tools would be impaired following left frontal damage, whereas both tasks would be sensitive to inferior parietal dysfunction. We also unveiled that posterior temporal cortex is committed to pantomiming tool grips, but that this region is not part of the general hand posture network.

Conclusion: We conclude that the generation of hand postures is subserved by a highly interconnected task-general neural network. Depending on task requirements some nodes/connections will be more engaged than others and these task-sensitive findings are in general agreement with recent lesion studies. The imitation of meaningless hand postures and the pantomiming of tool use should both be used in the diagnosis of apraxia as they can be differently impaired and indicate dysfunction of distinct visual streams.

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The age of stroke survivors affects people's causal attributions for their behavior

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Background and aims: Young stroke survivors often find that people often misunderstand their condition. This may be due to people misattributing the outcomes of stroke. This study examined whether behaviors resulting from stroke were attributed to other causes such as personality rather than the stroke, and whether these attributions were affected by the age of the stroke survivor.

Method: Participants read a scenario which described a male who showed four behaviour changes: fatigue, depression, irritability and time spent with friends. The male was said to be either 22, 72, or age unstated. For each behavior, participants (N = 120) rated three causal attributions as explanations: age, personality and stroke.

Results: When the stroke survivor was 22, participants attributed the behaviors more to personality than to age or stroke, whereas when he was 72, participants attributed the behaviors more to age than to personality or stroke.

Conclusions: This study shows that the attributions people make for behaviors resulting from a stroke are affected by the age of the stroke survivor. These attributions account for the misunderstandings often experienced by young stroke survivors. Implications of this finding for rehabilitation are discussed.

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Outcomes of information obtained from the neuropsychological assessment within a specialist alcohol and substance-related brain injury service

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Background & Objectives: arbias is a specialist service that supports people with alcohol- and substance-related brain injury. Neuropsychological services have been provided since its establishment in 1990. The communication of neuropsychological assessment results and provision of recommendations specific to the needs of the client and referrer are vital aspects of the neuropsychological evaluation. The aim of this study was to identify the longer-term outcomes of information provided to clients of the arbias neuropsychological assessment and intervention service (NPAIS) and their referrers.

Method: A survey of NPAIS clients and referrers within the past 18 months was undertaken to determine how the information from the assessment was utilized and its impact on various aspects of a client's functioning. Clients attended a follow-up session to complete a semi-structured interview and questionnaire, whilst referrers only completed the questionnaire.

Results: Outcome areas assessed were: knowledge and management of cognitive issues; knowledge and management of mental health or behavioural issues; daily functioning, including self-care, financial issues and accommodation/housing status; participation in educational/vocational/recreational activities; interpersonal functioning, including social interaction, parenting and criminal justice issues; and access to services and supports, including substitute decision-maker.

Conclusions: Differences in outcomes identified by referrers and clients is discussed. Consumer opinion on the usefulness of different feedback modalities (written versus verbal) is also explored. Finally, consumers identified a number of areas for improvement that would enhance their neuropsychological experience and outcomes.

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Conversation topics following severe traumatic brain injury: a study at three and six months post-injury
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Background and aims: People with TBI may have problems managing conversational topics. However, the nature and meaning of topics and recovery of these discourse abilities during sub-acute recovery is largely unknown. This study investigated the patterns and nature of conversation topics discussed by people with severe TBI and a familiar communication partner at 3 and 6 months post-injury, and changes occurring in conversational topics during sub-acute recovery.

Method: Twenty two people with severe TBI and a familiar communication partner engaged in a 10 minute casual conversation on self-selected topics at 3 and 6 months post-injury. Topic analysis (Mentis and Prutting, 1991) provided an understanding of conversational topic management by identifying patterns of topic initiation and maintenance. Qualitative content analysis (Sandelowski, 2000) was used to explore the nature of topics and generate conversational themes.

Results: Most conversational dyads maintained similar patterns of topic initiation during sub-acute recovery. Three main conversational themes were identified: connecting; re-engaging; and impacts of injury. The nature of conversation topics related to these themes changed subtly over time, reflecting participants' sub-acute rehabilitation experiences.

Conclusions: Qualitative analysis provides a new insight into conversation topics of people with severe TBI. Many people with severe TBI can engage in appropriate conversations and discuss mutually important topics with a familiar communication partner. Findings may inform speech-language pathology intervention in sub-acute recovery to improve discourse abilities of individuals with TBI.

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Evaluation of cognitive performance of stroke survivors by an intelligent cognitive assessment system

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Background and aims: Cognitive impairment can be one of deficits in stroke survivors. Visuo-spatial deficit, attention, orientation, memory and higher order cognitive ability problems are common cognitive complaints following stroke. However, the performance among these domains do varies.

This study aimed at investigating the performance among these cognitive domains for stroke survivors using test items in a computerize assessment system called "Intelligent Cognitive Assessment System" (ICAS) by Rasch Analysis.

Method: Stroke survivors fulfilled inclusion and exclusion criteria were recruited from rehabilitation hospital and geriatric day hospital. After obtaining subjects' consent, they were be assessed by ICAS. ICAS consists of 65 testing items across 13 cognitive domains: Abstract Thinking, Attention Span, Calculation, Executive Function, Working Memory, Orientation, Semantic memory, Sequence, Similarity Categorization, Visual Inattention, Visual Interference, Visual Recognition and Immediate Memory. The raw scores from the ICAS items were analyzed by Rasch Model to obtain linear score in the item difficulties. The difference of among cognitive domains were be tested by ANOVA.

Results: A total sixty-six subjects were recruited in the study. Their age ranged from 60 to 80 with mean =71.7 (SD=7). Fifty of them suffered from ischemia and 10 of them suffered hemorrhage. ANOVA showed that there were statistically

significant different among 13 cognitive domains for stroke survivors ($F=4.947$, $p < 0.001$). Hierarchies of cognitive domain performance for stroke survivors were developed.

Conclusions: With these hierarchies of cognitive domains for stroke survivor, guiding information in treatment planning for stroke survivors in cognitive rehabilitation can be obtained.

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White matter structure changes in language function areas of in Broca's aphasia patients using diffusion tensor imaging

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Objective: The rapid development of neuroimaging technology has provided a new perspective for studies of aphasia. Diffusion tensor imaging (DTI) is currently the only method for studying complex brain white matter in a living subject. In this study, we tried to investigate structural changes in brain white matter fiber structures of language function areas in Broca's aphasia patients using diffusion tensor imaging (DTI).

Materials and Methods: Routine sequence and DTI scans were performed on 30 Broca's aphasia patients and 20 healthy volunteers. Data were processed on a SIEMENS Leonardo

workstation, and the fractional anisotropy (FA) parameters of Broca's and Wernicke's areas and the arcuate fasciculus were calculated.

Results: The lesions in the 30 Broca's aphasia patients were all located in the left cerebral hemisphere. The average FA values of the left Broca's area and the corresponding area in the right hemisphere were 0.2080 ± 0.0526 and 0.2836 ± 0.0562 , respectively. In the healthy adult group, the average FA value of the left Broca's area was 0.2960 ± 0.0543 . The decrease in the average FA value of the left Broca's area observed in the aphasia patients relative to the healthy adults was significant. The left arcuate fasciculus also exhibited a major reduction compared with the right arcuate fasciculus in the patient group ($p < 0.001$). This reduction was particularly apparent in the anterior and middle segments of the left arcuate fasciculus. Some patients primarily presented structural damage to language function fiber pathways and variations in the arcuate fasciculi.

Conclusion: The decrease of fasciculi in Broca's area may cause Broca's aphasia. Damage to the fiber pathways of the language function area could also cause Broca's aphasia, suggesting that in addition to impairments in classical language centers, damage to other areas of the brain can also cause aphasia.

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