NEUROPSYCHOLOGICAL REHABILITATION SPECIAL INTEREST GROUP OF THE WFNR

11th NR-SIG-WFNR Conference

Monday 14th & Tuesday 15th July 2014

Conference Programme

Elias Beach Hotel, Limassol, Cyprus

CONFERNCE PARTNERS

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Contents

WELCOME

On behalf of Barbara Wilson, the NR-SIG-WFNR Executive Committee, the local organising Committee and the Scientific Committee I would like to welcome you to Limassol in Cyprus for the 11th Neuropsychological Rehabilitation Conference.

This is a multidisciplinary conference incorporating all rehabilitation disciplines including Neuropsychology, Clinical Psychology, Occupational Therapy, Speech and Language Therapy, Physiotherapy, Social Work, Medicine and Nursing. The primary focus of the conference is rehabilitation of neuropsychological consequences of acquired brain impairment.

The conference includes sessions on Measuring Outcomes in TBI; Emotion and TBI; TBI Rehabilitation; Dementia Rehabilitation; Paediatric and Adult ABI; Paediatric TBI; Rehabilitation in Adult ABI; Measurement Methods in TBI; Acquired Neurological Conditions; Paediatric Developmental and Neurological; Considerations in Assessment and Rehabilitation; CVA NeuroRehabilitation and TBI Rehabilitation

I would like to thank the Cyprus Tourist Bureau, University of Cyprus, PsychCorp from Pearsons, Emirates Airlines, Psychology Press, Raphael Medical Centre, ASSBI, WFNR and Cambridge Scholars Publishing for their support of the conference. I would also like to thank all the staff at the Elias Beach Hotel and Karatello Restaurant and last but not least Margaret Eagers-Rickit from MERS Events for managing the conference.

I hope you enjoy the conference!

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Plan of the Hotel

6 - Europa Conference Hall 1st Floor

Conference Programme at a glance – MONDAY

7.30-8.30	**Arrival, Registration and Dropping Posters at Registration Desk**
8.30-8.40	Welcome and Introduction- Fofi Constantinidou (Program Chair)
	Chair: Fofi Constantinidou
8.40-9.00	**Professor Barbara Wilson and Claire Robertson – Opening Address** *My Brain Doesn't Know Me Any More: Prosopagnosia, an insider's point of view*
	Session 1: Measuring Outcomes in TBI 9.00-10.00
	Chair: Jon Evans
9:00-9.20	**Jim Malec** - *Recommendations from the 2013 Galveston Brain Injury Conference for implementation of a chronic care model in brain injury*
9.20-9.40	**Robyn Tate** - *Measuring health outcomes after traumatic brain injury: a systematic review of currently-used behavioural instruments*
9.40-10.00	**Sara Simblett** - *Capturing the breadth of emotional experience following acquired brain injury: A positive spin on measuring outcomes in brain injury services*
	Session 2: Emotion and TBI 10.00-10.40
	Chair: Teresa Ashman
10.00-10.20	**Teresa Ashman** - *Effects of Exercise and Self-Affirmation Intervention after Traumatic Brain Injury*
10.20-10.40	**Jacinta Douglas** - *Communication-specific coping intervention improves functional communication and reduces stress in adults with severe traumatic brain injury (TBI*)
10.40-11.10	Morning tea & Posters
	Session 3: TBI Rehabilitation – Datablitz 11.10-11.50
	Chair: Fofi Constantinidou
11.10-11.18	**Jill Winegardner** - *Characterising Comprehensive Day Programme rehabilitation service users for service design (DB20)*
11.18-11.26	**Nicholas Behn** - *Subjective quality of life measurement in post-acute brain injury treatment studies: a review of the literature (DB3)*
11.26-11.34	**Sanne Smeets** - *Inter-rater reliability and convergent validity of the Clinician's Rating Scale for Evaluating Impaired Self-Awareness and Denial of Disability after Brain Injury (DB14)*
11.34-11.42	**Brian O'Neill** - *Effects of emWave2 Biofeedback in reducing emotional and behavioral problems in patients with acquired brain injury: A pilot trial (DB12)*
11.42-11.50	**Alfonso Caracuel** - *CloudRehab: a cloud computing e-Rehabilitation app for people with brain damage (DB5)*
	Session 4: Dementia Rehabilitation 11.50-12.30
	Chair: Kelly Knollan-Porter
11.50-12.10	**Matthew Jamieson** - *Technological memory aid use by people with acquired brain injury and dementia*
12.10-12.30	**Fofi Constantinidou** - *Categorization Training for Persons with Mild Cognitive Impairment: A Feasibility Study*
12.30-1.30	**LUNCH in Flavors Terrace & POSTERS**
	Session 5: Paediatric and Adult ABI – Datablitz -1.30- 2.10
	Chair: Maria Kambanaros
1.30-1.38	**Tamar Silberg** - *Emotional and behavioral problems among children with acquired brain injuries (ABI): are they related to mother's level of emotional distress? (DB13)*
1.38-1.46	**Fofi Constantinidou** - *The Proportion of Risk for TBI and Persisting Symptomatology in Cypriot Secondary School-Age Children (DB6)*
1.46-1.54	**Kelly Knollan-Porter** - Concussion management in intercollegiate athletics: Lessons learned from the Miami University Concussion Management Program *(DB10)*
1.54-2.02	**Fiona Ashworth** - *Evaluation of a Compassionate Mind Relatives Group (DB1)*
2.02-2.10	**Fiona Ashworth** - *The reality, challenges and tribulations of setting up a randomised control trial of compassion focused therapy for mental health problems after traumatic brain injury (DB2)*
	Session 6: Paediatric TBI 2.10-3.30
	Chair: Barbara Wilson
2.10-2.30	**Leigh Schrieff** - *Investigating the relationship between brain oxygenation (PbtO2) and neuropsychological and behavioural outcomes in children following severe TBI*
2.30-2.50	**Leigh Schrieff** - *A 5-year demographic profile of, and the implementation of an attention-training intervention with, children who have sustained a severe TBI in Cape Town, South Africa*

2.50-3.10 **3.10-3.30**	**Catherine Haslam** - *Delivering errorless learning via Skype: Comparison of active and passive forms of the learning principle in children with brain injury* **Jill Winegardner** - *Executive functioning mediates the relationship between age of injury and peer relationship problems following childhood acquired brain injury (ABI)*
3.30-4.00 **4.00-4.20**	Poster Session Afternoon Tea
  4.20-4.40 **4.40-5.00** **5.00-5.20** **5.20-5.40**	**Session 7: Rehabilitation in Adult ABI – 4.20-5.40** **Chair:** Michael Perdices **Dirk Bertens** - *Effects of combining errorless learning and Goal Management Training on daily executive functioning after acquired brain injury* **Jose Leon-Carrion** - *Neuropsychological rehabilitation after TBI through brain cortex synchronization* **Lesley Murphy** - *The Development of an Assessment Framework for people in Low Awareness States - the LAAF* **Tamara Ownsworth** - *Self-concept changes following brain injury rehabilitation: A systematic review*
6.30-11.00	Conference Dinner

POSTERS - MONDAY

1	Ashworth, Fiona	The Case of Diogenes and Disgust: deficit or denial? A Clinical Puzzle
2	Behn, Nicholas	Treatment definition and fidelity of a flexible and individualised treatment for people with acquired brain injury
3	Bentick, Leeanne	Developing the voice through music: Does the therapeutic application of music in speech and language rehabilitation improve speech intelligibility and vocal quality in spasmodic dysphonia?
4	Bentick, Leeanne	The impact of Neuro-functional Reorganisation (NFR) on Swallow Function as a Treatment for Acquired Brain Injury (ABI)
5	Cassel, Anneli	What do families want? Family feedback about their needs on an inpatient neurorehabilitation ward
6	Dhamapurkar, Samira	Continuing improvement after a long period of impaired consciousness
7	Erez, Neta	Procedural learning following thalamic damage in an 18yr old girl - case study
8	Evans, Jon	Neuropsychological Rehabilitation in Alcohol Related Brain Damage: A Systematic Review
9	Geurten, Marie	When Children Stop Trusting What They Have Perceived
10	Gooden, James	Self-awareness, self-regulation and return to driving after TBI
11	Goodwin, Rachel	Evaluation of NeuroText for people with multiple sclerosis
12	Gower, Samual	Analysing antecedents to aggressive behaviour in a residential neuro-rehabilitation programme and their relationship to the International Classification of Functioning, Disability and Health framework
13	Groet, Erny	Obstructive sleep apnea affects functional and cognitive status of stroke patients
14	Holleman, Meike	Comprehensive neuropsychological rehabilitation (INR): effects on coping and quality of life
15	Kambanaros, Maria	Cross-linguistic transfer effects after cognate-based therapy in a case of multilingual Specific Language Impairment (SLI)
16	Keohane, Clare	Identifying the prevalence and nature of hyperacusis in a traumatic brain injury population and its relationship to measures of anxiety and depression: An exploratory study
17	Kylstra, Wytske	Brain injured people in the sub acute phase: from confusion towards self-management
18	Mokienko, Olesya	Brain-computer interface trainings for patients with cortical and subcortical stroke
19	Mole, Joseph	Lost in time and space" following a right thalamic infarct: a challenge for compassion focussed therapy
20	Mole, Joseph	Where did the time go?: A case study investigating the role of the thalamus in the processing of time
21	Oliveira, Mirian A F	Neuropsychological intervention plan in post-stroke patient in the cerebellar region
22	Oliveira, Mirian A F	The use of International Classification of Functioning (ICF) as a tool in the establishment of goals in a case of Diffuse Axonal Injury (DAI)
23	Visser-Keizer, Annemarie	Mental Information Processing and Mental Fatigue In Stroke Patients

Conference Programme at a glance - TUESDAY

8.00-8.30	Arrival – Drop Posters at Registration Desk
	Session 8: Measurement Methods in TBI – 8.30-9.30
	Chair: Robyn Tate
8.30-8.50	**David Tulsky** - *New Assessment Strategies for Measuring Outcome Following Brain Injury*
8.50-9.10	**Jim Malec** - *Precision, dimensionality, and sensitivity to change in brain injury outcome measures*
9.10-9.30	**Mark Sherer** - *Aspects of residual symptoms of traumatic brain injury in the post-acute period*
	Session 9: Acquired Neurological Conditions – Datablitz – 9.30-10.18
	Chair: Tamara Ownsworth
9.30-9.38	**Caroline van Heugten** - *Effectiveness of the Restore4Stroke self-management intervention "Plan Ahead!": a randomized controlled trial in stroke patients and partners (DB16)*
9.38-9.46	**Hakon Hofstad** - *Measured and self-reported cognitive functioning in chronic stroke patients one year after admission (DB9)*
9.46-9.54	**Wendy Boerboom** - *Social participation in patients with SAH: Long-term outcome (DB4)*
9.54-10.02	**Rachel Goodwin** - *External memory aids for people with multiple sclerosis: A systematic review (DB8)*
10.02-10.10	**Thialda Vlagsma** - *Effectiveness of a Strategic Executive Training (ReSET) in Parkinson's Disease (DB17)*
10.10-10.18	**Hans Markowitsch** - *Autobiographical memory rehabilitation in patients with dissociative amnesic disorders and an immigration background(DB11)*
10.20-10.50	**Poster Session**
10.50-11.20	**Morning Tea**
	Session 10: Paediatric Developmental and Neurological Disorders 11.20-12.20
	Chair: Jill Winegardner
11.20-11.40	**Christiana Ktisti** - *A novel computational framework for the microgenetic analysis of reading remediation programs*
11.40-12.00	**Maria Kambanaros** - *Comparative Biolinguistics: Investigating verb/noun dissociations in developmental and acquired language disorders*
12.00-12.20	**Andrea Makri** - *Memory in children with epilepsy: comparison between the neuropsychological screening of Greek-Cypriot children with and without epilepsy*
	Session 11: Considerations in Assessment and Rehabilitation - Datablitz –12.20-1.00
	Chair: Jennie Ponsford
12.20-12.28	**Gisela Wolters Gregorio** - *Coping, executive functioning, and psychosocial functioning of individuals with severe neuropsychiatric symptoms after acquired brain injury (DB21)*
12.28-12.36	**Barbara Wilson** - *Long Term Users of a Paging System: How do they differ from typical users of this service? (DB18)*
12.36-12.44	**Samira Dhamapurkar**- *Does a regular Wessex Head Injury Matrix (WHIM) assessment predict infections in low awareness patients? (DB7)*
12.44-12.52	**Barbara Wilson** - *Rare and unusual syndromes: A follow –up study (DB19)*
12.52-1.00	**Christiana Theodorou** - *Examining the factors of the Psychiatric Diagnostic Screening Questionnaire (PDSQ) (DB15)*
1.00-2.00	**LUNCH in Flavors Terrace and POSTERS**
	Session 12: CVA NeuroRehabilitation – 2.00-3.20
	Chair: Theodore Tsaousides
2.00-2.20	**Marieke Visser** - *Relationships between problem solving skills, depression and health-related quality of life during outpatient rehabilitation for stroke*
2.20-2.40	**Noomi Katz** - *Cognition and participation contribution to Return to Work 3 month after first ever mild stroke*
2.40-3.00	**Caroline van Heugten** - *Psychological determinants of subjective cognitive complaints 2 months post stroke*
3.00-3.20	**Caroline van Heugten** - *Neurologically-focussed early intervention service improves quality of life in survivors of a cardiac arrest*
3.20-3.50	**Afternoon tea & Posters**

	Session 13: TBI Rehabilitation – 3.50-5.10
	Chair: Jim Malec
3.50-4.10	**Satu Baylan** - *Changes in Functional Brain Activation Following Brief Goal Management Training with Implementation Intentions: an fMRI Study*
4.10-4.30	**Jennie Ponsford** - *Light therapy for fatigue following traumatic brain injury*
4.30-4.50	**Brian O'Neill -** *Prevalence and Types of Sleep Wake Disturbances in Closed Head Injury Rehabilitation Inpatients*
4.50-5.10	**Theodore Tsaousides** - *Online Emotional Regulation Group Treatment for Individuals with Traumatic Brain Injury: Increasing Access to Healthcare*
5.10-5.30	**Conference close: Professor Barbara Wilson**
5.30-6.30	**Meeting of the NR-SIG-WFNR**

POSTERS – TUESDAY

24	Olukolade, Olugbemi	Treatment of memory retrieval and word production in Dementia using Cognitive rehabilitation
25	Osborn, Amanda	Prevalence and severity of depression following TBI: A meta-analysis comparing different measures, samples and time-intervals
26	Powell, Theresa	If I start doing that I'll never get my memory back…"
27	Prince, Leyla	Family intervention in a community neuropsychological rehabilitation setting
28	Rose, Anita	Emerging from the minimally conscious state (MCS) - What does art therapy offer?
29	Rose, Anita	A possible new methodology for evaluating patient responses
30	Rose, Anita	Analysis of slow stream inpatient neuro-rehabilitation outcomes
31	Rose, Anita	Seeing red: Relearning to read in a case of Balint's Syndrome
32	Saard, Marianne	Differences of attention component dysfunction in children with neurological disorders help rehabilitation planning and predict outcome
33	Seedheeyan, Shashi	Don't touch me! Rhythmical Massage Therapy (RMT) for pain management in a patient with acquired brain injury
34	Seedheeyan, Shashi	Can Oil Dispersion Bath (ODB) with Valerian Oil be used as a treatment for sleep disturbance in carers of patients with an Acquired Brain Injury (ABI)
35	Shiel, Agnes	Developing and piloting the Wessex Head Injury Matrix 2
36	Shiel, Agnes	"I think he'd be better off if he had died": Family and Care Staff Perspectives of Chronic Disorders of Consciousness
37	Stargatt, Robyn	What cognitive deficits do reading remediation programs for children with reading delays that arise from a TBI sustained in infancy need to take account of?
38	Svestkova, Olga	Prevocational rehabilitation in the Czech Republic
39	Taub, Anita	Cognitive training and cognitive-behavioral techniques in the rehabilitation of visual-spatial deficits
40	van Heugten, Caroline	Predictors of impaired awareness of deficits early in the rehabilitation process of patients with acquired brain injury
41	Vanzan, Serena	Caloric Vestibular Stimulation (CVS) in Low Awareness States
42	Winegardner, Jill	A multi-model approach to re-capturing identity following right hemisphere stroke
43	Wolters Gregório, Gisela	Executive functioning, neuropsychiatric symptoms, and quality of life after acquired brain injury
44	Zhang, Tong	The motor function improvement of the effected hand after stroke induced by music-supported therapy: a functional magnetic resonance imaging study

MONDAY ABSTRACTS are in presentation order

Opening Address:

My Brain Doesn't Know Me Any More: Prosopagnosia, an insider's point of view

Wilson, Barbara A[1] and Robertson, Claire[1]
[1]The Oliver Zangwill Centre, Cambridge, UK

Imagine having good eyesight, being able to read well, name objects and know whether someone's emotional expression signifies, happiness, sadness, fear, anger, disgust or surprise and yet be unable to recognise your spouse, your children or even yourself. This is what Claire, a wife, mother and former nurse experiences every day. Claire survived an illness, encephalitis, in 2004, which did not affect her physical ability, her language or her basic vision but left her with face blindness also known as prosopagnosia. Part one of this presentation consists of a detailed description of prosopagnosia, including a summary of the differences between those who can recognise people by voice or name and those, like Claire, who have lost semantic knowledge of people. Part two is a personal account from Claire herself, who explains what it is like to be unable to recognise her family and friends and how this has affected her identity. At first she felt she was in an unknown world, one where all the parameters had changed. She did not know herself or anyone else. She was very confused with her own feelings of 'self' and how and where she fitted in. Even now Claire feels that nobody knows very much about the person she is, least of all Claire herself, who observes that she is alone, a stranger to herself. Claire concludes by telling her story, including a little about her rehabilitation and her situation ten years after the illness.

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Session 1: Measuring Outcomes in TBI

Recommendations from the 2013 Galveston Brain Injury Conference for implementation of a chronic care model in brain injury

Malec, James F.[1,2] and Hammond, Flora M.[1,2]
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[2]Rehabilitation Hospital of Indiana, Indianapolis, Indiana USA

The 2013 Galveston Brain Injury Conference (GBIC) convened approximately 50 experts including consumer representatives in brain injury (BI) clinical practice, research and policy to focus on the topic of "Brain Injury as a Chronic Condition." This presentation will describe recommendations and their rationales emanating from these deliberations. The group split into four task forces. The Guideline Development Task Force focused on identifying priority areas in which care guidelines are needed. The High Priority Implementation Task Force identified high priority recommendations for more immediate practice changes. The Self-management Support Task Force focused on developing recommendations for self-management and provider support of self-management, and the Health Care and Community Systems Integration Task Force focused on community-medical systems integration. Recommendations emphasized the importance of the development of clinical guidelines and surveillance technologies, improved specialist-primary care-community provider communications, patient-provider collaboration, use of existing educational resources, and risk-stratified self-management support and case management. Recommendations range from those that minimize new costs by leveraging existing resources to more costly initiatives, such as, lifelong case management and resource facilitation. Nonetheless, even the cost of these more complex and sustained initiatives have the potential to be offset in the long term by reduction of health and social problems among those living with BI that carry a high price in dollars and in human suffering. While GBIC recommendations are not exhaustive, progressive implementation is very likely to have a favorable impact on outcomes of individuals with BI by reducing long-term complications and enhancing access to appropriate care.

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Measuring health outcomes after traumatic brain injury: a systematic review of currently-used behavioural instruments

Tate. Robyn L.[1,2]; Godbee, Kali[1] and Sigmundsdottir, Linda[1]
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[2] Royal Rehabilitation Centre Sydney, Australia

Background and aims: The clinician or researcher wishing to evaluate function after traumatic brain injury (TBI) is often overwhelmed by the number of available instruments. We conducted a systematic review to identify currently used health outcome measures and to provide clinicians and researchers with a resource list.

Methods: We searched two electronic databases (Medline and PsycINFO; last updated 6 September, 2012) for full-length publications in peer-reviewed journals on TBI published in English since 2000. Studies referring to behavioural instruments to assess adults with TBI in the title or abstract were included. Instruments were classified against the International Classification of Functioning, Disability and Health (ICF).

Results: After exclusions and deletion of duplicates, a final pool of 2,593 unique reports was subject to further examination, yielding 728 instruments meeting selection criteria. The Body Functions component contained the largest number of instruments (n=466), most of which addressed the mental functions domain (n=370). A substantially smaller set of instruments was identified that evaluated specific motor-sensory and other body functions (*n*=64), or were multi-domain across a number of body functions (*n*=33). The Activities/Participation component was represented by 109 instruments and a small number of instruments examined environmental (*n*=22) and personal (*n*=36) factors. An additional 60 instruments were multidimensional, covering multiple ICF components, as well as 35 instruments assessing concepts not covered in the ICF (e.g., quality of life).

Conclusions: This review identified a vast number of instruments and provides an up-to-date resource of currently used instruments that will be valuable for both clinicians and researchers.

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Capturing the breadth of emotional experience following acquired brain injury: A positive spin on measuring outcomes in brain injury services

Simblett, Sara K.[1,2,3]; Tyerman, Andy[4]; Ring, Howard[2,3,5] and Bateman, Andrew[2,3,6]
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[2]Department of Psychiatry, University of Cambridge, UK
[3]Collaborations for Leadership in Applied Health Care and Research for Cambridgeshire and Peterborough, National Institute of Health Research, UK
[4]Community Head Injury Service, Buckinghamshire Healthcare NHS Trust, Aylesbury, UK
[5]Addenbrooke's Hospital, Cambridgeshire and Peterborough NHS Foundation Trust, UK
[6]Oliver Zangwill Centre for Neuropsychological Rehabilitation, Ely, UK

Background and Aims: Emotional distress is a common and understandable reaction to changes and losses associated with experiencing an acquired brain injury (ABI). ABI services aim to facilitate emotional adjustment and bring about improvement in mood, self-concept and level of functioning. Many employ

measures of symptoms of depression and anxiety to monitor outcomes. This paper presents data suggesting that these tools may not measure the breadth of emotional experiences reported following ABI and describes an alternative measure. In addition it proposes a positive spin on measurement of emotional functioning, focusing on the concept of wellbeing.
Method: Psychometric properties of the Head Injury Semantic Differential Scale (HISDS) were investigated using Rasch analysis of responses from a sample of adults with ABI (n = 264). The reliability and validity, including the dimensional structure, of the scale was examined. Targeting of the scale was compared to the Beck Depression Inventory (BDI-II) and Beck Anxiety Inventory (BAI) completed by a subset of the sample (n = 134).
Results: The original HISDS deviated significantly from the expectations of the Rasch model (X^2 (N = 264, 40) = 172.0, p < .001). However, a brief modified scale functioned as a valid and reliable unidimensional measure (X^2 (N = 255, 28) = 28.0, p = .46; PSI = .93). The construct measured by the HISDS was better targeted to the emotional experiences of people following ABI than the BDI-II or BAI.
Conclusions: A brief version of the HISDS may be a more appropriate measure of emotional functioning following ABI alongside any scales to assess presence of symptoms of depression and anxiety disorders. The focus on measuring positive outcomes such as wellbeing in ABI services may help to encourage the maintenance of a positive outlook on life.
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Session 2: Emotion and TBI

Effects of Exercise and Self-Affirmation Intervention after Traumatic Brain Injury

Ashman, Teresa[1]; Shan, Yuen[2]; Shan, Lee[2]; Lee, Christine[2]; Shang, Andrea[3] and Suzuki, Wendy[3]
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[2]Rusk Rehabilitation, New York University Langone Medical Center, New York, New York, USA
[3]Department of Neuroscience, New York University, New York, New York, USA

Background: Physical exercise has been proven to be an effective method for improving cognition and mood, but little is known about its benefits among individuals with traumatic brain injury.
Objective: This pilot study investigated the feasibility of a combined exercise and self-affirmation intervention (IntenSati) for enhancing cognition and mood in individuals with TBI. It was hypothesized that this intervention would improve individuals' cognition and mood following the completion of the program.
Method: This intervention was held at an outpatient rehabilitation department in an urban medical center. A wait-list control design was conducted. Twenty-one adult participants—at least 12-months post-TBI—enrolled in the study. Twelve of them completed the study. Assessment was conducted at three time-points throughout the study using neuropsychological and self-report measures to evaluate participants' cognition and mood. Following initial evaluation, participants were assigned into either the immediate intervention group or the waitlist control group. During the intervention, participants attended the program twice a week over the course of 8 weeks. Debriefing was conducted following the completion of the program.
Results: Both independent *t* tests and paired *t* tests were utilized. Results indicated that the intervention group experienced less depressive symptoms following the completion of the IntenSati program compared to the waitlist control group. Participants also reported having less depressive symptoms, experienced more positive affect, and had a higher quality of life following the completion of the program. Moderate-to-large effect sizes were found on decrease in negative affect. However, results associated with cognitive benefits were mixed. The participants tolerated the program well and reported satisfaction with the program.
Conclusions: Results from this study indicated that the IntenSati exercise program is a feasible and beneficial intervention for individuals with TBI as supported by the positive impact on their mood and quality of life.
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Communication-specific coping intervention improves functional communication and reduces stress in adults with severe traumatic brain injury (TBI)

Douglas, Jacinta;[1] Knox, Lucy;[1] Mitchell, Carren[1] and Bridge, Helen[1]
[1]Department of Human Communication Sciences, La Trobe University, Victoria, Australia

Background and aims: People with TBI and their close others describe everyday interactions as a long-term challenge frequently associated with ongoing stress. Communication-specific Coping Intervention is a new treatment developed to target coping in the context of communication breakdown. The intervention incorporates the procedures and principles of cognitive behavioural therapy, self-coaching and context-sensitive social communication therapy. This project examined the effectiveness of the intervention in a group of adults with TBI and chronic communication difficulties.
Method: Participants were 13 adults with severe TBI (GCS: 3 – 8; mean age 35.2 years; mean time postinjury 7.6 years). The intervention runs over 6-weeks focusing on use of productive coping strategies by shaping strategies already evident in the client's behavioural repertoire. The project involved 3 phases: 1) Control/pre-intervention wait phase (multiple assessments), 2) Treatment (6 weeks) and 3) Follow-up (12 weeks). Repeated measures ANOVA with planned pairwise comparisons were used to test the significance of change. Where the assumption of sphericity was violated, Greenhouse-Geisser correction was applied. Effect size was indexed by partial eta squared.
Results: Intervention elicited statistically significant improvements in coping, functional communication and stress that were maintained for 3 months. Improved interpersonal communication was evident in clinician blind ratings. Clients reported significant reduction in stress at the end of treatment and 1 and 3 months later. Close others reported significant increase in observed use of productive strategies following treatment and maintained for 3 months.
Conclusions: This intervention provides a promising means of improving communication-specific coping and reducing communication dysfunction and its negative consequences for people with TBI.
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Session 3: TBI Rehabilitation – Datablitz

Characterising Comprehensive Day Programme rehabilitation service users for service design

Gracey, Fergus[1,2]; Malley, Donna[1,2]; Wagner, Adam[1] and Clare, Isabel[1] Presented by Jill Winegardner
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Background: Needs of people following acquired brain injury vary over their life-course presenting challenges for community services, especially for those with 'hidden' neuropsychological needs. Characterisation of subtypes of rehabilitation service user may help improve service design towards optimal targeting of resources. This exploratory study characterises a neuropsychologically complex group of service users.

Method: Preliminary data from 35 participants accepted for a holistic neuropsychological rehabilitation programme were subject to a 2-step cluster analysis, a method appropriate for analysis of this sample size, using self-ratings of mood, executive function and brain injury symptomatology.

Results: Analysis identified 3 clusters significantly differentiated in terms of symptom severity (Cluster 1 least and Cluster 2 most severe), self-esteem (Clusters 2 and 3 low self-esteem) and mood (Cluster 2 more anxious and depressed). Post-hoc analyses identified cluster 2 as the most complex, with most severe symptoms, and young age of injury.

Conclusions: Results show distinct categories of complex neuropsychological need, highlighting the importance to rehabilitation service design of early identification and provision of rehabilitation to prevent deterioration, especially for those injured when young. We suggest that innovative conceptual frameworks for understanding potentially complex longer term outcomes are required to enable development of tools for triaging and efficient allocation of community service resources.

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Subjective quality of life measurement in post-acute brain injury treatment studies: a review of the literature

Behn, Nicholas[1]; Cruice, Madeline[1]; Marshall, Jane[1] and Togher, Leanne[2]
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Background and aims: Improving the quality of life (QOL) of people with brain injury is often considered the ultimate aim of rehabilitation. However, there is a wide range of measures and treatment approaches to improve QOL post-injury. This paper aims to examine brain injury treatment studies to: (1) describe which treatments produce change in QOL and; (2) describe what type of QOL measures detect change.

Method: The PsycBITE database (Tate et al., 2004) was searched in September 2013 for brain injury treatment studies, using the search criteria: studies post-2000, group studies, TBI/head injury, adults 18+, and English. Studies were required to have used at least one self-administered QOL measure.

Results: Seventy-four of 358 citations met the inclusion criteria. These covered a variety of treatments (communication, psychological, cognitive, peer-mentoring, physical, and meaningful activity) and used 111 different QOL measures, classified as multi-dimensional health-related QOL (HRQOL), uni-dimensional HRQOL (i.e. cognitive, physical, psychological or social health), and subjective well-being (SWB). Studies typically used more than one QOL measure (Mean= 2.8 measures; Range= 1-8) and collectively investigated 208 treatment-QOL relationships. Overall, 37.5% of the QOL measures detected significant change from treatment, with the most change from meaningful activity (50%) and psychological treatments (40%). Psychological health (53%) and SWB (44%) were the measures that most detected change.

Conclusions: Subjective QOL measurement for people with brain injury is important for understanding the impact of an injury. There is, however, a need for international consensus on the type of QOL measures used to better compare the different treatment types.

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Inter-rater reliability and convergent validity of the Clinician's Rating Scale for Evaluating Impaired Self-Awareness and Denial of Disability after Brain Injury

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Background and aims: In clinical practice two types of patients with self-awareness disturbances after acquired brain injury are recognized. Some patients overestimate their competencies, possibly resulting from an underlying neurological deficit. This is called impaired self-awareness. Other patients deny their impairments. This may be an automated psychological process that protects against anxiety and is called defensive denial. The Clinician's Rating Scale for Evaluating Impaired Self-Awareness and Denial of Disability after Brain Injury (CRS-ISA-DD) helps clinicians evaluate these two disturbances. The aim of the study was to investigate inter-rater reliability and convergent validity of the CRS-ISA-DD for use in the Dutch clinical practice.

Method: Participants were Dutch community-living patients with moderate-severe traumatic brain injury. Participants completed the Patient Competency Rating Scale (PCRS) and COPE Inventory. For each participant, two observers completed the CRS-ISA-DD.

Results: 57 patients participated in this study. Inter-rater reliability of the CRS-ISA-DD was good: ICC was .96 for the ISA subscale (p=.00) and .91 for the DD subscale (p=.00). Convergent validity was low. We expected the ISA subscale to be associated with scores on the PCRS. However, Spearman's correlation coefficient was -.08 (p=.57). In addition we expected to find a positive association between the DD subscale and the avoidance coping subscale of the COPE Inventory. However, scores on the avoidance coping subscale were negatively associated with scores on the DD subscale (r=-.30, p=.03).

Conclusions: The CRS-ISA-DD is a reliable scale for evaluating impaired self-awareness and denial of disability in the Dutch clinical practice. Convergent validity however is low.

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Effects of EmWave2 Biofeedback in reducing emotional and behavioral problems in patients with acquired brain injury: A pilot trial

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Background and Aims: The objective of this study was to explore the feasibilty of using emWave2 heart rate variability (HRV) biofeedback in people with brain injury. A randomised control crossover trial was used to provide preliminary evidence whether biofeedback training is effective in reducing behavioural and emotional difficulties following brain injury.

Method: Ten participants with moderate to severe brain injury were randomised to EmWave-first or treatment-as-usual conditions. HRV biofeedback training was used 10-20 minutes per day, five days a week for four weeks. Repeated measurements using the Depression, Anxiety and Stress Scale (DASS) and the Modified Overt Aggression Scale (MOAS) were taken at baseline, after four and eight weeks.

Results: Nine out of ten participants showed 80% or greater compliance with training, indicating that using emWave2 biofeedback is feasible with this population. Most participants reported that emWave2 was easy to use and helpful. There was no significant difference between DASS total score or MOAS scores, before and after emWave. No significant differences between the two groups were found in change scores for DASS (medium-large effect size) and MOAS scores. Group inequality at baseline is a factor in this small n. Those with higher anxiety in baseline showed improvement.
Conclusions: Given that the intervention was feasible and deemed useful by participants, it is recommended that data collection with a larger sample should proceed.
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CloudRehab: a cloud computing e-Rehabilitation app for people with brain damage.

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Background and aim: Neurorehabilitation programs for brain injury are based on training under the in situ supervision of professionals. Using appropriate e-rehabilitation systems some patients might beneficiate of programmed practicing of activities at home. Aim: to examine effectiveness of CloudRehab, an e-Rehabilitation mobile-based application.
Method: the participant was a 53 years old male with left hemiplegic due to a stroke ten months ago. A single case research design with two phases (eight days baseline, eight days treatment) was conducted. The target behavior was “putting on and buttoning a shirt”, that was always conducted for a relative. Step in CloudRehab: (1) patient and occupational therapist (OT) recorded a video at the hospital; (2) the video was uploaded to a website platform and three sessions of training at day were programmed; (3) at home, the mobile of the patient indicated when he should to star each session and showed the video; (4) the patient performance was recorded and uploaded immediately after sessions; (5) feedback from the OT was sent to the patient through the system..
Results: Eight defined criteria about patient performance were assessed by two blind OT using a scale from 1 to 3. Baseline phase showed stability of patient performance. The two standard deviation band method was applied. All measures at the treatment phase were outside the band showing improvement of performance of the target behavior.
Conclusions: CloudRehab is an effective system due to guided, programmed and supervised training of activities at home.
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Session 4: Dementia Rehabilitation

Technological memory aid use by people with acquired brain injury and dementia

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Background and aims: Evans et al. (2003) investigated memory aid use by people with acquired brain injury (ABI) and found little use of technological memory aids. The present follow-up study aims to investigate whether technological memory aid use has increased in the last decade, what predicts use and what differences exist between people with ABI and dementia.
Method: A survey containing a memory aid checklist, demographic questions and memory questionnaires was sent to a group of people with ABI (current/past patients of a community brain injury service and attendees at seven Headway charity centres), and to people on a dementia research network database. We aim to recruit 100 people from each group.
Results: Data from the first 80 respondents (40 ABI, 40 dementia) were analysed. In the ABI group 50% of people used mobile phone reminders, 42.5% used an alarm/ timer and 50% stated they asked someone to text them. People with ABI use significantly more reminding technology than people with dementia ($t = 5.86$, $df = 58.19$, $p < 0.001$). In a stepwise regression analysis technological memory aid use was best predicted by pre-morbid technology aid use and current non-technological memory aid use in both groups. The data also suggest that education level and whether or not a person is working are also important predictors in the ABI group.
Discussion: Technological memory aid use has increased markedly in people with ABI, but use by people with dementia is low. Methodological issues and implications for rehabilitation services are discussed.
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Categorization Training for Persons with Mild Cognitive Impairment: A Feasibility Study

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Background and aims: Categorization is a basic cognitive skill present in all activities of daily living. It is essential for memory and learning, problem solving, and decision-making. Research in patients with TBI demonstrated that categorization training is an effective tool to remediate cognition in residential rehabilitation. However, categorization training has not been implemented with adults with mild cognitive impairment (MCI) or early stages of dementia. The purpose of this study was to test the hypothesis that a systematic cognitive training with the Categorization Program (CP) will improve categorization abilities and neuropsychological performance in adults with MCI.
Method: The CP is a systematic hierarchical starting from concrete tasks and progressing to more abstract skills. It addresses the two areas of categorization: recognition and categorization of everyday objects; and new category learning and decision making. Outcome measures include three categorization tests (CP Test 1, 2 & 3) and 4 probe tasks (to check generalization of skills) along with extensive neuropsychological battery. Ten participants with MCI and 10 healthy older adults completed the program to date (average age = 71.70, SD = 4.47; average education = 9.20 years, SD = 4.47, range = 5 - 19) completed the CP. All participants received 3-4 hours of cognitive treatment per week for 10-12 weeks.
Results: MANOVA analyses resulted in significant gains on the CP Tests demonstrating improvement in the ability to describe objects ($F = 21.90$, $p = .002$) and to identify common traits between objects and extract organization rules ($F = 6.56$, $p = .031$). Participants also demonstrated significant gains in generalizing abilities to new tasks across time ($F = 10.95$, $p = .005$), which following a linear trend ($F = 30.70$, $p = .000$).
Conclusions: The preliminary findings suggest that systematic cognitive training implementing the CP protocol could be a useful and feasible tool for the training of categorization skills in older adults with MCI in community settings. Currently we are training more participants and exploring the long-term effects of training.

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Session 5: Paediatric and Adult ABI – Datablitz

Emotional and behavioral problems among children with acquired brain injuries (ABI): are they related to mother's level of emotional distress?

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Background and aims: Parents of children with acquired brain injuries (ABI) tend to report high levels of emotional and behavioral problems among their children. Additionally, these parents often experience high levels of emotional distress (ED), compared to the general population. This study aims were to examine both: (I) levels of ED among mothers of children with ABI, compared to community-based mothers of healthy children; and (II) the relationship between maternal ED and their report on the children's' behavioral and emotional problems.

Methods: We reviewed medical data on mother–child dyads (N=45) of children with ABI between the years 2009-2012. Mothers completed the 12-item General Health Questionnaire (12-GHQ) and the Child Behavior Checklist (CBCL), during a routine neuropsychological assessment. Mothers' ED scores were compared to community-based counterparts (N= 657), with similar socio-demographic characteristics from the Israel National Health Survey (INHS).

Results: Mothers in our sample had significantly higher 12-GHQ scores ($M = 9.3$; 95% CI= 7.4-11.1) than their community-based counterparts (INHS) ($M = 6.6$; 95% CI= 6.2-7). In addition, 23% of the sample mothers had 12-GHQ scores compatible with *DSM-IV* depression or anxiety disorders. A significant positive correlation between 12- GHQ and CBCL scores was observed. Significant differences were found in CBCL scores between mothers with high compared to low 12-GHQ scores.

Conclusions: The current findings can be seen as an alert sign with regard to the reliability of maternal reports on behavioral problems among children with brain injuries, and also a "case for action" in planning preventive psychological interventions for mothers as well as their children.

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The Proportion of Risk for TBI and Persisting Symptomatology in Cypriot Secondary School-Age Children

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Background & Aim: This study is part of the first systematic program investigating the incidence of traumatic brain injury (TBI) in school-age children in the Republic of Cyprus. The specific study focuses on adolescents (ages 12-18). We implemented the Greek version of the Brain Screening Questionnaire (BISQ) and hypothesized that 8-10% of the participants would sustain TBI-related symptoms.

Methods: Participants. The BISQ was sent out to 700 children (ages 12-18) attending rural and urban elementary schools from varied socioeconomic backgrounds. 238 adolescents or 34% completed and returned the questionnaires and participated in the study.

Results: Out of the 238 valid BISQs, 23 (or 9.66%) adolescents were identified at risk for TBI. Eleven were male and twelve were female. Based on the BISQ, adolescents were identified at risk if they have sustained alteration of mental status and had 5 symptoms specific to TBI. Several participants reported more than one event that resulted in a concussion. Most common causes of blows to head were: injuries during sports, falling wile biking, falling down stairs and falling from high place. Most frequent symptoms between teenagers who sustained TBI were: headaches, feeling angry, difficulty to waking up after a regular sleep or a nap, night mares and being easily distracted.

Conclusions: A proportion of adolescents at risk for TBI-related complications attend public schools in Cyprus. These children are at risk to sustain the psychosocial and cognitive manifestations of TBI. These children should be followed in order to assess their overall cognitive and academic status, ensure that they reach age-appropriate milestones, and receive appropriate rehabilitation services and support.

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Concussion management in intercollegiate athletics: Lessons learned from the Miami University Concussion Management Program

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Background and aims: Recently, there has been a heightened awareness of the symptoms and risks associated with sports-related concussion. While a gold standard management protocol is not in place at this time, for 14 years the Miami University Concussion Management Program has been successful in the assessment and management of the unique neurobehavioral and neurocognitive symptoms athletes experiences post injury. The aim of this presentation is to describe the established procedures of one of the oldest university based multi-disciplinary concussion management programs that is coordinated by speech-language pathology.

Method: The Miami University Concussion Management Program has conducted baseline assessment in over 1,000 athletes with 174 referred for concussion management. Paper and pencil and computerized assessments are utilized to assess both baseline and post concussion symptomatology. This presentation will present two case studies to illustrate the implementation of an multi-disciplinary concussion management protocol. The first case is an example of athlete, following sports-related concussion, with a typical recovery pattern of 6 days where as the second example describes the management protocol of an athlete whose symptoms extended beyond the traditional 10 day recovery period.

Results and Conclusions: Successful management of sport-related concussion requires a multi-disciplinary team that understands the unique neurobehavioral and neurocognitive symptoms that are associated with concussions. Facilitators and barriers of multidisciplinary collaboration will be discussed in order to ensure the appropriate management of post-concussion symptoms so that athletes can return to athletic, academic and social endeavors, with success.

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Evaluation of a Compassionate Mind Relatives Group

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Background and aims: Relatives of those with traumatic brain injuries (TBI) commonly experience carer strain, negatively impacting on their mental health and wellbeing. Relatives can experience guilt, blame and self-criticism in response to the consequences of their relative's TBI. Compassion focused interventions (Gilbert, 2009) aim to ameliorate self-criticism and associated difficulties as well as provide individuals with tools to cope and improve their wellbeing. Given the chronicity of TBI, supporting relatives to develop a more 'compassionate mind' may provide a useful addition to their coping repertoire. The development and evaluation of a new 'Compassionate Mind Relatives Group' (CMRG) is described here.

Method: The CMRG aimed to offer a space for support with regards to the impact of living with a relative with TBI and to provide Compassionate Mind Training (CMT) as tools to manage and improve wellbeing. A seven-week intervention of a weekly 1.5-hour group was offered to relatives. Questionnaire measures of self-criticism, self-compassion, symptoms of anxiety and depression were taken at baseline, end of group and 3-month review. Weekly satisfaction and group fit measures were taken including qualitative comments regarding the group's impact.

Results: Questionnaire measures indicated positive changes in wellbeing. Qualitative comments endorsed the usefulness of combining a supportive space with developing additional CMT coping strategies.

Conclusions: Evaluation suggests the CMRG was useful in offering a space for support and improving wellbeing for the relatives. However, further evaluation of such groups is needed with more focused research to understand which relatives may benefit most from such an approach.

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The reality, challenges and tribulations of setting up a randomised control trial of compassion focused therapy for mental health problems after traumatic brain injury

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Background and Aims: Mental health problems are a significant challenge faced by those with Traumatic Brain Injury (TBI). Developing the evidence base for psychological therapies is therefore important in identifying what works for whom with this client group. The proliferation of new and existing psychological therapies within mainstream mental health has lead to the widening of therapies available to clients, although these may not have been rigorously evaluated. One particular approach, which has appeal for those with TBI, is Compassion Focused Therapy (CFT; Gilbert, 2009). CFT is used clinically with people with TBI, but has yet to be examined in terms of efficacy. The current paper aims to describe the process of setting up an RCT of CFT for people with TBI who have mental health difficulties with problematic self-criticism and shame.

Methods: The paper will first discuss the current guidance for RCTs in psychological therapies, followed by some challenges this poses with this group and how one may work to manage these difficulties. The paper will then consider the issues faced with delivering a novel psychological therapy with this heterogeneous group, where emotion dysregulation is common. The paper will finally consider the practical aspects of delivering an RCT where funding is not available and resources are low.

Conclusions: This paper outlines the challenges of planning an RCT of this novel psychological therapy with clients with TBI. This is clearly a complex process and although there are certainly ways of managing the issues arising, there are many testing factors.

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Session 6: Paediatric TBI

Investigating the relationship between brain oxygenation ($PbtO_2$) and neuropsychological and behavioural outcomes in children following severe TBI

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Background and aims: Efforts aimed at improving outcome post-TBI are often directed at preventing secondary brain injury, for example, by controlling physiological parameters, such as brain tissue oxygen tension ($PbtO_2$). Research shows that low $PbtO_2$ is common and is associated with increased morbidity and mortality in children. However, no studies to date have investigated neuropsychological and behavioural outcomes in children in relation to $PbtO_2$-based monitoring.

Methods: We employ a retrospective, quantitative design. The sample included N=11 English- and Afrikaans-speaking children, aged 7 – 14 years (mean age, 10 years) who were admitted for closed, severe TBI and who were at least 1 year post-injury. We collected neuropsychological and behavioural data from patients, who met the inclusion criteria and who underwent $PbtO_2$ and intracranial pressure monitoring for brain injury since 2006. We divided the sample into two groups: one group of children who experienced at least one episode of $PbtO_2 \leq 10$mmHg during the period of monitoring (Hypoxia), and another group of children for whom $PbtO_2$ remained above 10mmHg throughout the entire monitoring period (No Hypoxia).

Results: Results show that the Hypoxia group performed significantly more poorly than the No Hypoxia group on VIQ and FSIQ, and composite measures of basic and higher-order attention, verbal and visual memory, executive functions, visuospatial ability, and expressive language. The groups did not differ on behavioural measures employed.

Conclusion: These results underscore the prognostic value of $PbtO_2$ as a significant parameter determining outcome and the importance of including neuropsychological and behavioural outcomes in future $PbtO_2$ studies.

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A 5-year demographic profile of, and the implementation of an attention-training intervention with, children who have sustained a severe TBI in Cape Town, South Africa

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Background and aims: Pediatric traumatic brain injury (pTBI) is a global public health problem and a leading cause of mortality and morbidity in children and adolescents. In South Africa (SA), however, both recent epidemiological evidence for, and neuropsychological rehabilitation interventions following, pTBI, has been lacking. This paper describes 1) a demographic profile of severe pTBI admissions to the Red Cross War Memorial Children's Hospital (RXH), and 2) our early efforts at implementing an attention-training intervention following severe pTBI.

Method: Study 1 is a 5-year retrospective, descriptive study of children admitted to the RXH with severe TBI (June 2006 - April 2011), who required intracranial monitoring. Study 2 is a case-controlled trial. It involved the evaluation of a 10-week neuropsychological intervention (Pay Attention!) for children following TBI. The study included an intervention group and three matched control groups.

Results: Results for study 1 showed that the peak admission age was 6 years; more boys than girls were admitted, especially on weekends; and the major mechanism of injury was pedestrian road traffic accidents. Results for study 2 showed some specific gains for individual participants, which did not generalize across domains.

Conclusion: The identification of etiological factors, and the description of demographic profiles of children sustaining TBI, constitutes a basis for preventative policy administration and intervention strategies in SA. Continued neuropsychological intervention research is needed to identify those factors that make the experience and rehabilitation of pTBI unique to our local context. Such research will aid in facilitating interventions for pTBI in future.

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Delivering errorless learning via Skype in children with brain injury: Comparison of active and passive forms of the learning principle

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Background and aims: Recent research has shown that errorless learning (EL) helps children with acquired brain injury (ABI) learn novel information. Less clear, however, is the efficacy of more active forms of EL for this population. The present research focused on this issue, but did so using a novel method of delivery through skype to allow consideration of additional factors of intervention efficiency and cost-effectiveness.

Method: Currently 12 children with ABI between the ages of 8 to 16 years have been recruited into the study. Participants learned novel age appropriate science and social science facts under three conditions: active EL (involving self generation of the correct response), passive EL (with the examiner providing the correct response), and errorful (or trial-and-error) learning. Condition order was counterbalanced with the number of items presented for learning varied as a function of memory impairment severity to avoid floor and ceiling effects. Memory for these facts was then tested after 5 minutes, 30 minutes, 1 hour and 24 hours.

Results: Analysis of data revealed no effect of time with information acquired initially retained over the 24 hour period, regardless of condition. However, there was a main effect of condition with recall under active EL better than passive EL, and both forms more effective than errorful learning.

Conclusions: The present study provides the first demonstration of (a) enhanced memory performance with use of active EL in children with ABI and (b) successful incorporation of skype in delivering EL interventions.

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Age of injury, mental health problems and executive functioning in understanding disrupted social relationships following childhood acquired brain injury

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Background: Childhood acquired brain injury (ABI) is associated with increased risk of psychiatric morbidity and peer relationship problems. This study sought to address mixed findings in prior research concerning the roles that age of injury, age, emotional problems and executive functioning may play in these poor longer term outcomes.

Method: Participants were 51 children with acquired brain injury (32 Traumatic Brain Injury; 29 male) referred to a community neurorehabilitation service. Emotional problems and social outcomes were measured using the Strengths and Difficulties Questionnaire (SDQ), and executive functioning was measured with the Behaviour Rating Inventory of Executive Functions (BRIEF). Correlational and mediation analyses were used to explore variables associated with peer relationships.

Results: Analysis indicated time since injury, peer relationship problems, metacognitive, behavioural and problems correlated with age at injury. These variables and emotional problems correlated with peer relationship problems. Linear multiple regression analyses indicated that only metacognitive skills remained a significant predictor of peer relationship problems, and metacognitive skills was found to significantly mediate this association.

Conclusion: The study confirms the significant effect of childhood ABI on relationships with peers and mental health, those injured at a younger age fairing worst. Our findings suggest that younger age of injury influences later peer relationships via the mediating role of poor metacognitive skills.

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Session 7: Rehabilitation in Adult ABI

Effects of combining errorless learning and Goal Management Training on daily executive functioning after acquired brain injury

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Background and aims: Many brain-injured patients referred for outpatient rehabilitation have executive impairments that lead to difficulties in the execution of everyday-life tasks. Goal Management Training (GMT) is an effective treatment for these problems. GMT entails learning and applying an algorithm, in which daily tasks are subdivided into multiple steps. Main aim of the present study is to examine whether using an errorless learning approach (preventing the occurrence of errors during the acquisition phase of learning) contributes to the efficacy of GMT in the performance of complex daily tasks.

Methods: The study is a double blind randomized controlled trial, in which the efficacy of GMT with an errorless learning approach is compared with conventional GMT, based on trial and error learning. In both conditions 30 patients with acquired brain injury of mixed etiology were enrolled. Main outcome measure was the performance on two individually chosen untrained everyday-tasks before and after treatment, using a standardized observation scale.

Results: Preliminary analyses showed a significant interaction effect between time (pre- and post-treatment) and treatment condition (GMT-errorless learning and conventional GMT) ($p<.001$). The patients who underwent GMT combined with errorless learning improved more (mean difference score=60.5, sd=26.6) on task performance than the patients whom were given conventional GMT (mean difference score=11.6, sd=20.4).

Conclusions: The present results indicate that combining errorless learning and GMT improves the execution of complex daily life tasks in brain-injured patients. The study may contribute to the optimization of the treatment of executive deficits.
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Neuropsychological rehabilitation after TBI through brain cortex synchronization

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Background and aims: The disruption of cortical connections after traumatic brain injury (TBI) often results in disorders of consciousness. And yet, the neural basis of consciousness has received relatively little attention until very recently. The purpose of this work is to help fill this gap by analysing cortical connectivity in patients with severe neurocognitive disorder (SND) and in the minimally conscious state (MCS).
Method: We used EEG to obtain the resting state data of two carefully matched severe TBI patient groups (16 patients), seven MCS and nine conscious TBI patients with SND. Coherence, Granger causality, regression analysis and t-tests were used to identify functional connections that differed between the two patient groups.
Results: Our results showed two synchronized networks subserving consciousness, a retrolandic, or cognitive network, and a frontal executive control network. Patients in the MCS showed severely altered synchronization between these networks compared to SND patients, with higher levels of consciousness and a preserved alertness. It appears that the executive control network could help synchronize cortical neurons throughout the brain by means of temporally precise high frequency oscillations. A breakdown in synchrony and coherence leads to the disruption or disappearance of consciousness.
Conclusions: We suggest that synchronization between these brain regions is essential to awareness, and that the frontal lobe is a surrogate marker for preserved consciousness.
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The Development of an Assessment Framework for people in Low Awareness States - the LAAF

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Background and aims: Assessing the psychological functioning of a person in a low awareness state is notoriously difficult. People who have sustained catastrophic brain injuries often have problems with movement, speech, language and vision, making conventional assessment impossible. In recent years, measures such as SMART, the WHIM and the JFK use combinations of measuring responses to sensory stimulation and observational methods to ascertain the nature of a brain injured person's functioning. The LAAF attempts to bridge the gap between such measures and conventional psychological assessment tools.
Method: Two main assessment paradigms are set out: the CAVE (Cognitive Assessment by Visual Election), using eye movement as an output method, and the CAYN (Cognitive Assessment using Yes/No) using yes/no responses. For the CAVE, reliability and validity were established with a patient sample n = 37, from the Royal Hospital for Neurodisability, ranging from borderline vegetative state to profound brain injury with yes/no communication established.
Results: For the CAVE, reliability and validity values were as follows: inter-rater reliability r = 0.95, test-retest reliability r = 0.9, internal consistency = 0.56 and validity (using British Picture Vocabulary Scale, Western Neuro Sensory Stimulation Profile and the Disability Rating Scale) were r = 0.77, 0.56, -0.45 respectively. On the CAYN, a series of questions to investigate basic cognitive functions including verbal comprehension, orientation, immediate memory, calculation, mood and insight is suggested. The CAVE is currently undergoing reliability and validity evaluation.
Conclusions: Reliable and valid assessment of very severely brain injured individuals, even with profoundly physical disabilities, is not impossible. The LAAF provides the clinician with an assessment framework, and guidelines to extend and adapt the framework to suit the needs of the individual and to investigate further areas of functioning.
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Self-concept changes following brain injury rehabilitation: A systematic review

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Background and aims: Brain injury rehabilitation broadly aims to improve people's capacity to live meaningful and fulfilled lives. Such programs are theorized to facilitate the process of rebuilding sense of self or identity. This review aimed to evaluate the impact of brain injury rehabilitation on self-concept following TBI.
Method: A systematic search of PsycINFO, Medline, CINAHL and PubMed was conducted from inception to September 2013. Intervention studies reporting pre- and post-intervention changes on a validated measure of self-esteem or self-concept in a TBI sample (if mixed aetiology $\geq$70% were TBI) were eligible for review. Methodological quality of randomised controlled trials (RCTs) was examined using the Physiotherapy Evidence Database (PEDro) scale.
Results: A systematic search strategy yielded 17 TBI studies (10 RCTs, 4 non-RCT group studies, 3 case studies) that examined the impact of psychotherapy, family-based support, cognitive rehabilitation or occupational interventions on self-concept. Five RCTs (mean PEDro score: 3.4/10) reported significant improvements in self-concept based on within-group analyses. There was more support for the positive impact of cognitive (2 RCTs) and occupational interventions (2 RCTs) on self-concept than psychotherapy or family-based support. However, due to the low methodological rigor of some RCTs it was not possible to draw conclusions regarding the efficacy of rehabilitation for improving self-concept after TBI.
Conclusions: There is currently a lack of robust evidence concerning the impact of brain injury rehabilitation on self-concept. Recommendations for future research relate to the need to develop assessment tools and intervention approaches based on theories of identity reconstruction after brain injury.
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Poster Abstracts - Monday

1. The Case of Diogenes and Disgust: deficit or denial? A Clinical Puzzle

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Background and Aims: We present TD, a 54-year-old man with Diogenes Syndrome, commonly known as Senile Squalor Syndrome. He was hospitalised after being found living in squalor. At the initial assessment, TD was unable to identify emotional expressions of disgust. The aim is to determine whether TD's difficulties were due to neuropsychological deficits associated with processing and understanding disgust related stimuli, including emotion based decision making and damaged olfactory bulbs or to a psychological defense mechanism or a combination of the two.

Method: Further assessments were administered including a brief olfactory test, the Iowa Gambling Task to measure emotion based decision making, experimental pictures of disgusting scenes and two questionnaires to assess interoceptive abilities and experiences of disgust and internal shame. Qualitative data were also collected.

Results: Although within the normal range on the Iowa Gambling Task, suggesting his emotion-based decision-making was intact, TD failed the olfactory test suggesting a damaged sense of smell. His responses to the pictures indicated that he found them highly disgusting. He demonstrated understanding of the consequences of the disgusting stimuli and reported repeatedly that he would never and had never lived in such a state. He understood the consequences of disgusting stimuli but denied even the normal experience of shame.

Conclusions: We suggest that TD's failure to identify expressions of disgust was probably due to a psychological defence mechanism. Abnormally low scores on the Internalised Shame Scale, thus denying experience of shame, support this.

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2. Treatment definition and fidelity of a flexible and individualised treatment for people with acquired brain injury

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Background and aims: Behavioural treatments following brain injury typically comprise a number of complex factors. Researchers need to define the active ingredients of the treatment and to establish treatment fidelity to ensure the treatment was implemented as intended (Hart, 2009). This paper aimed to explain treatment definition and fidelity for a project-based treatment (PBT), which is an individualised and flexible group treatment for people with brain injury.

Method: A focus group (FG) of professionals (5 SLTs, 1 OT) with minimum 2 years experience in brain injury was convened for 90 minutes to identify the active ingredients for PBT. The FG was transcribed and analysed using thematic analysis (Creswell, 2009) then translated into coding behaviours that should be observed during PBT, thus, contributing to the content of the treatment manual. Prospective fidelity checks are being undertaken (11% of data from two PBT groups) to ensure no therapist drift.

Results: The analysis of the FG revealed four themes (PBT, group therapy, clinical skills for running PBT groups, PBT manual) defining and describing the behaviours required for conducting PBT groups. These themes were translated into 19 coding behaviours (4 project-therapy behaviours; 10 therapist behaviours; 5 participant behaviours) and the treatment manual (consisting of 10 sessions).

Conclusions: This study highlights the importance of defining the active ingredients of a treatment and establishing coding behaviours to assist with fidelity checks. Such processes should be an essential component and consideration of any brain injury treatment study.

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3. Developing the voice through music: Does the therapeutic application of music in speech and language rehabilitation improve speech intelligibility and vocal quality in spasmodic dysphonia?

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Background and aims: Singing and speaking involve the use of the same mechanisms and systems to articulate sounds. Singing has been found to be beneficial in rehabilitating speech and language skills when they have been affected by neurological injury. Research has shown that singing reduces muscle tension in spasmodic dysphonia and can support increased speech intelligibility. Breath support is an important requirement for voice in speech and singing. Literature has indicated that oral motor and respiratory exercises enhances articulatory control, respiratory strength and function of the speech apparatus. We determined whether a woman with spasmodic dysphonia would benefit from the therapeutic use of music in speech and language rehabilitation to improve speech intelligibility and vocal quality.

Method: A pilot study, using a single case experimental design, was carried out to investigate the effects of a joint music therapy and speech and language therapy programme. This involved oral motor and respiratory exercises and therapeutic singing incorporating targeted articulated sounds in familiar songs. Baseline measures using the Perceptual Voice Screening assessment and the Grade Roughness Breathiness Asthenia and Strain (GRBAS) assessment were taken pre and post music intervention. The results were blindly rated by an independent assessor.

Results: Preliminary results show a positive change in voice quality and speech intelligibility following joint intervention of music therapy and speech and language therapy.

Conclusions: The results indicate the therapeutic application of music in speech and language therapy is important in treating spasmodic dysphonia. Therefore, a larger study is planned to investigate the effects further.

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4. The impact of Neuro-functional Reorganisation (NFR) on Swallow Function as a Treatment for Acquired Brain Injury (ABI)

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Background and aims: In the 1970's, a Brazilian Speech and Language Therapist, Beatriz Padovan, combined the views of Rudolf Steiner (Austrian Philosopher) and Temple Fay (American Neurosurgeon), and created a new approach by incorporating the concept of vegetative-reflex functions experienced in all human beings, which she found to complement the original Neurological Reorganisation approach significantly. This paper aims to explore how Padovan's Method of Neuro-functional Reorganisation might impact on an individual's swallow function following ABI.

Method: We investigated the NFR approach. This initially focuses on the most primitive exercises, with the view of reaching all the natural evolutionary phases with further input. The approaches used for those brain injured patients with swallowing difficulties, requires both corporal and oral-facial exercises to improve the impairment. According to the principles of the method, each phase needs to be worked upon in the sequence of natural evolutionary processes. However, this is dependent on the ability and capacity of each patient and their tolerance to treatment.

Result: Results suggest that this approach can be used with those patients who have experienced a disturbance during their development or to the organisation of the Central Nervous System.

Conclusion: Further research is required in the field of the efficacy of NFR when working with an adult population of ABI with swallowing impairments. Research studies will need to focus on whether NFR method can create improvements in the swallow function.

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5. What do families want? Family feedback about their needs on an inpatient neurorehabilitation ward

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Background and Aims: Families influence the recovery and long-term outcome of an individual with acquired brain injury (ABI) and family involvement in rehabilitation results in better outcomes for the individual. However, there is a scarcity of literature understanding what family needs are during inpatient neurorehabilitation and how to best address these needs.
This study aimed to gather feedback from relatives of individuals with an ABI on an inpatient neurorehabilitation ward about their psychoeducation and support needs during their relative's admission.

Method: A semi-structured questionnaire was designed focusing on identifying family psychoeducation and support needs and possible ways to address these needs. All relatives who attended the ward over a four-week period were given a copy of the questionnaire and asked to provide feedback following informed consent.

Results: 62.5% of relatives approached returned the questionnaire. 100% of respondents reported having psychoeducation and support needs. These needs would optimally be addressed early in their relative's admission, sessions offered monthly throughout admission, and with flexibility for individual or group sessions.

Conclusions: The need for "early, continuous and comprehensive service delivery" for relatives (Leith et al., 2004) was highlighted in responses, as was the need for flexibility to personal preferences. Recommendations for service development were made, which included advice on: 1) information provision; 2) future ward-based groups; 3) identifying relatives at-risk of distress and 4) development of a comprehensive family support 'tool-kit' for staff. However, further audit and intervention is necessary to ascertain how best to identify and meet family needs during inpatient neurorehabilitation.

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6. Continuing improvement after a long period of impaired consciousness

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Background and aims: Severity of brain injury is determined by the depth and duration of coma. Most patients who recover from coma open their eyes by four weeks post injury. They are then no longer in coma. They may have recovered full consciousness or they may still have reduced awareness/a disorder of consciousness. Only about 9 per cent of patients who remain with a disorder of consciousness after several months show some recovery. There is a paucity of evidence on the type of recovery shown by such patients. The aim of this study is to show the gradual improvement of a man who sustained a TBI through an assault and who remained with a disorder of consciousness for nineteen months before emerging from the minimally conscious state (MCS).

Method: The patient was assessed repeatedly through his two year stay at a rehabilitation hospital with the Wessex Head Injury Matrix, The JFK coma recovery scale, and the Sensory Modality Assessment Rehabilitation Techniques. He also received intensive inpatient multi-disciplinary rehabilitation.

Results: The patient remained in a vegetative state for nearly 14 months before progressing to the MCS where he remained for a further five months. He then emerged from the MCS. Over the next eight months he continued to improve both cognitively and physically to such an extent that he can now function with minimal assistance.

Conclusions: Even after long periods of impaired consciousness, it is possible for patients to show meaningful improvement if they receive appropriate rehabilitation and assessment.

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7. Procedural learning following thalamic damage in an 18yr old girl - case study

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Background and aims: Procedural learning is the capacity to acquire skills through practice and is composed of motor skills and habits, associative and nonassociative learning and priming. Procedural learning is associated with a distributed neuronal network of primary and supplementary motor cortical areas, basal ganglia and cerebellum. Some evidence suggests that the thalamus is also involved in procedural learning.

Methods: We present a case study of occupational rehabilitation of an 18yr old girl after a left thalamic and hypothalamic hemorrhage following excision of a neurocytoma. The girl displayed rt. hemiparesis, trans-cortical aphasia, and significant impairments in motor planning and execution of sequential tasks. Due to the comprehensive damage, standard cognitive and motor tests couldn't be performed but major difficulty in basic activities of daily living was clinically observed. Intensive repetitive training of functional tasks which were previously acquired such as dressing, bathing and making coffee was undertaken. Repeated sequences were provided with an errorless learning approach and visual anchors, keeping environmental cues constant.

Results: After six months of intensive inpatient rehabilitation, functional tasks which were presented and practiced were acquired to a level of supervised independent performance. However, no transfer to other functional tasks was displayed.

Conclusions: Achievement of specific daily functions following thalamic damage is possible through intensive rehabilitation supportive of procedural learning. However, the difficulty to re-acquire basic functional tasks supports the role of the thalamus in procedural learning.

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8. Neuropsychological Rehabilitation in Alcohol Related Brain Damage: A Systematic Review

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Background and aims: The evidence base for rehabilitating alcohol related brain damage (ARBD) is still in its infancy. The aim of this review was to collate evidence of intervention studies for ARBD and Wernicke-Korsakoff Syndrome (WKS), to offer some indication of methodological quality, and to suggest directions for future research in this area.

Method: A comprehensive search strategy resulted in systematic review of sixteen studies investigating neurorehabilitation of cognitive impairment relating to ARBD.

Results: Most studies addressed rehabilitation of the memory impairments associated with Korsakoff's Syndrome, although one study seeking to remediate executive functioning impairment was also included. Three studies outlining service models or approaches were included, with the aim of generating advances in service development for this population.

Conclusions: The reviewed studies were of varying methodology, allowing only tentative conclusions. However, the available evidence suggested benefits of a number of memory rehabilitation strategies. Options for practice are suggested.

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9. When children stop trusting what they have perceived

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Background and aims: A common hypothesis to explain metamemory heuristics learning throughout childhood lies on the assumption that the knowledge underlying these metacognitive rules develop from people's prior day-to-day experiences. However, the specific processes that sustain this learning are still unclear. In this study, we examined the mechanisms implicated in this empirical development by manipulating the learned interpretation of the Easily Learned = Easily Remembered (ELER) heuristic through an implicit process involving the detection of environmental regularities.

Method: A sample of sixty normally developing children aged 4-5, 6-7, and 8-9 years old was recruited for this study. Each child participated in three 60-minute sessions separated approximately by one-week interval and was trained to learn implicitly a reverse interpretation of the ELER heuristic. The influence of executive functions on children's judgment of learning at posttest was also investigated.

Results: In addition to an early development of the ELER heuristic, results revealed a reduction of this heuristic's use after the implicit training in the two youngest groups. Furthermore, executive monitoring was demonstrated to account for the lack of change observed in older children after the training phases.

Conclusions: In a developmental perspective, these findings present a coherent picture of children's learning of metacognitive heuristics. Specifically, automatic and implicit learning was demonstrated to be followed by an effortful control of the heuristics' use.

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10. Self-awareness, self-regulation and return to driving after TBI

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Background and Aims: Return to driving is often a key goal in rehabilitation following traumatic brain injury (TBI); however, research exploring self-awareness of on-road driving in individuals with TBI is limited. As a result of reduced self-awareness, it is possible that some people with TBI may not self-regulate their driving habits to accommodate for difficulties upon returning to driving. This study aimed to explore self-awareness and self-regulation of driving in individuals with TBI.

Method: Participants recruited thus far include 20 individuals with moderate to extremely severe TBI (PTA duration: M=35.33 days, SD=32.70), and 26 healthy age, gender and education matched controls. Participants completed an on-road driving assessment, questionnaires investigating their past and intended driving habits, and a new measure of self-awareness of driving performance. Participants also completed a follow up questionnaire three months after returning to driving.

Results: Preliminary findings revealed that TBI participants were intending to drive significantly less frequently and avoid more complex situations than prior to injury. Intended avoidance was significantly higher for the TBI group compared to controls. Self-awareness was unrelated to intended self-regulation. On follow up, TBI participants reported driving significantly less frequently compared to premorbid driving habits.

Conclusions: TBI participants reported intending to self-regulate their driving habits, regardless of self-awareness, and after three months reported a significant reduction in their driving frequency. Thus, individuals with moderate to extremely severe TBI may have altered driving habits post injury and may ease themselves back into driving despite passing a formal on-road assessment.

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11. Evaluation of NeuroText for people with multiple sclerosis

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Background and aims: Memory problems are reported in 40-60% of people with multiple sclerosis (MS) (Rao et al., 1993), they can affect independence in activities of daily living and may limit their ability to benefit from rehabilitation. Previous research in the field of memory rehabilitation for people with MS is inconclusive and of poor quality (das Nair et al., 2012). There is good evidence to support the use of NeuroPage, a memory aid service in people with acquired brain injury (Wilson et al., 2001). The aim of this study is to evaluate the effectiveness of the NeuroPage service for people with MS who have memory problems.

Method: A multicenter, single-blind randomised controlled crossover design will be used. Treatment efficacy will be determined by comparing treatment (memory texts) to an active control (social texts) on a range of measures, including subjective memory reports and mood. Sample size was calculated at 66 participants, accounting for drop-outs. The intervention has been named 'NeuroText' for clarity, in light of the increasing use of texts on phones, and the decreasing use of pagers. The active control has been developed to ensure that it is the specific content of the memory messages that serve as a memory aid, rather than the act of simply receiving a message working as a prompt.

Results: Group (treat first versus control first) by time (baseline, post-treatment) analyses of covariance will be conducted, with baseline performance as a covariate. Results will be available in 2015.

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12. Analysing antecedents to aggressive behaviour in a residential neuro-rehabilitation programme and their relationship to the International Classification of Functioning, Disability and Health framework

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Background and aims: Of the many problems that result from an acquired brain injury, the literature highlights aggression as being one of the most difficult for services and families to manage. Aggression is one of the most socially and vocationally disruptive, and additionally can be a barrier to delivering specialist rehabilitation treatment and support. The frequency of types of aggression within residential rehabilitation services has been under described in the literature. This study aims of explore types of antecedents and aggression recorded within a specialist brain injury rehabilitation service in terms of the relationship to the International Classification of Functioning, Disability and Health framework (ICF).

Method: Aggressive behaviours were recorded by support staff on a form breaking them into antecedent, behaviour and intervention, for a case series. The antecedent and behaviour were then categorised and coded, as was the severity of the behaviour, both in terms of frequency and severity. Antecedents were considered within the ICF framework, with a particular focus on Environmental and Personal Factors. Outcome measures routinely used in the programme were correlated on these ICF factors.

Results: The severity of the behaviour decreased for all behaviour codes across the admission. There was a moderate change in frequency. Environmental Factors and Personal Factors as conceptualised by the ICF were particularly important in the type of situations in which aggression occurred. There was a link between some outcome measure scores, antecedents and aggression.

Conclusions: ICF framework provided a useful framework in which to better understand an individual's pattern of aggression within a residential rehabilitation programme. Aggression is a communication tool and needs to be understood within an individual's context. Better understanding antecedents to aggression has implications for developing individualised rehabilitation programmes that focus on reducing aggression and other aspects of rehabilitation, including emotional regulation and participation in meaningful activities.

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13. Obstructive sleep apnea affects functional and cognitive status of stroke patients

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Background and aims: Obstructive sleep apnea (OSA) is a highly prevalent sleep disorder in stroke patients and is known to increase the risk of recurrent stroke and of post stroke mortality. To date, the effect of OSA on the functional and cognitive outcome following stroke is not well established. The primary aim of the study was to compare stroke patients with and without OSA on functional and cognitive status upon admission to our rehabilitation center.

Methods: A total of 152 patients underwent sleep examination for diagnosis of OSA. We performed a neurological and cognitive assessment, and rated their activities of daily living (ADL). We also administered questionnaires on fatigue, sleepiness and mood.

Results: Thirty-seven percent of the stroke patients had OSA (n = 56). The majority of patients were middle-aged and male. No difference in stroke severity was objectified. As regards to functional status, OSA-patients had a worse overall neurological status and showed more ADL problems than non-OSA patients. As for cognitive functioning, OSA patients performed worse on tasks of attention, visuoperception and non-verbal problem solving than patients without OSA. In the cognitive domains of memory and executive functioning, and the reported levels of fatigue, sleepiness and depressive symptoms no difference was seen.

Conclusions: Stroke patients with OSA have worse an overall neurological status, encounter more difficulties in ADL and show a decrease in attention, visuoperception and problem solving as compared to non-OSA patients. Thus, we conclude that OSA negatively affects the functional and cognitive outcome of stroke patients.

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14. Comprehensive neuropsychological rehabilitation (INR): effects on coping and quality of life

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Introduction: The Intensive NeuroRehabilitation (INR) programme is a comprehensive or holistic, outpatient, neuropsychological rehabilitation service that aims to treat problems resulting from cognitive, emotional, and behavioural changes that persist in the chronic phase after acquired brain injury. It consists of four days a week of therapy, during two times seven weeks, with a two-week 'home practice break' in between. Important objectives of the programme are to improve coping skills for dealing with the consequences of the injury, and to increase acceptance, resulting in improvement in quality of life.

Method: Seventy patients (44 male, 26 female) with acquired brain injury (e.g., traumatic brain injury, stroke, extirpated tumour), referred to the INR programme, were included in a randomised, waiting-list controlled study. Patients were included in the control (N = 33) or experimental (N = 37) group based on time of referral. The waiting-list group underwent two assessments, 14 weeks apart, before treatment, and the experimental group underwent a pre- and post-treatment assessment. Differences between the pre- and post-treatment assessment (experimental group) were compared to differences between baseline and pre-treatment assessment (control group). Assessment consisted of neuropsychological tests and questionnaires tapping coping styles and quality of life.

Results: Changes in passive (decrease) and active coping (increase) are expected in the experimental group compared to the control group, as well as significant improvement in self-reported quality of life.

Discussion: Changes in coping styles and self-reported quality of life will be discussed.

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15. Cross-linguistic transfer effects after cognate-based therapy in a case of multilingual Specific Language Impairment (SLI)

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Background and aims: Globally, the number of children who have SLI and are speaker-hearers of more than two languages is growing rapidly. Yet research on the implications of multilingualism for children with SLI is sparse. This poses a significant challenge to clinical decision-making about both assessment and intervention.

Theories of bilingual language processing have extensively focused on cognates words with similar form and meaning across languages (e.g., English/Greek *tiger*/*tigris*). For bilingual aphasia, intervention has identified transfer effects for cognate words only (Kohnert, 2004; Kurland & Falcon, 2011), while in language teaching, bilingual children were reported to find cognate picture names easier to retrieve (Kelley & Kohnert, 2012). Intervention involving cognate words has *not* been exploited in the framework of SLI. This study is the first to investigate cross-linguistic transfer (CLT) effects after cognate-based therapy in multilingual SLI.To provide evidence for theory-driven intervention using cognate-based therapy in a case of multilingual SLI with severe word-finding difficulties. Furthermore, CLT benefits will be used to inform theoretical models of multilingual language processing (e.g., Marini & Fabbro, 2007) and domain-specific vs. domain-general accounts of SLI.

Method: The participant, I.S., was an 8;6-year-old right-handed female, enrolled in grade 3 of primary school, not receiving speech-language therapy or special education. She was exposed to Cypriot Greek and Bulgarian from birth and from 4;6 years was immersed in an English-speaking private school where Standard Greek was also taught. Greek (either variety) was considered her dominant, English her most proficient language. All languages were regularly used on a daily basis: (Cypriot) Greek and Bulgarian at home, English and (Cypriot/Standard) Greek at school. I.S.'s general IQ score was 84 (WISC-III), her non-verbal IQ 102. Language abilities were assessed prior to the study using a battery of standardized tests (English/Greek) and an informal language measure (Bulgarian). I.S. met the criteria for SLI with common deficits across the three languages in several linguistic domains (morphosyntax, phonology, lexicon). Measures of language performance for cognates and non-cognates was taken at four stages: pre-therapy, during therapy, immediately post-therapy and one month after therapy in English, Greek and Bulgarian. Cognate-based intervention was provided in English in nine 20-minute sessions over 3 weeks and I.S. received phonological intervention based on (i) a cueing hierarchy technique and (ii) metalinguistic reinforcement founded on the phonological similarity of the words.

Results: Post therapy, the improvement remained significantly greater for English. An increase in Greek and Bulgarian on cognate naming performance from baseline to phase 3 was ca. 40%, which implies CLT effects. Performance on non-cognates in Greek and Bulgarian remained low and constant, while in English the gain was much smaller than that observed with cognates (from a 14% baseline to 34% at phase 3).

Conclusions: Overall, CLT effects were evident after intervention, but only on trained cognates. There was some generalization to non-treated non-cognates for English but not for Greek or Bulgarian.

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16. Identifying the prevalence and nature of hyperacusis in a traumatic brain injury population and its relationship to measures of anxiety and depression: An exploratory study

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Background and Aims: Hyperacusis following traumatic brain injury is frequently noted in clinical practice but is underreported in the literature. What actually constitutes hyperacusis has been open to wide interpretation with other terminology used, or associations made with similar, but distinct, auditory conditions. For the purpose of this study hyperacusis was defined as 'An unusual tolerance to ordinary everyday sounds' (Vernon 1987)

The aims of this study were:

- To identify the prevalence of hyperacusis in a TBI population
- To explore possible risk factors associated with the presence of hyperacusis following a TBI
- To identify the main symptoms of hyperacusis that present in TBI patients

Method: A cross sectional study was carried out on 60 TBI participants. A self-rating questionnaire was utilised to identify the presence of hyperacusis (HQ Kalfa et al 2002), A proportion of participants also completed the Hospital anxiety and depression scale (HADS) (Zigmond & Snaith 1983) to explore correlations between scores. An item analysis identified symptoms associated with hyperacusis in this client group.

Results: Hyperacusis was found to have a prevalence of 7.5% and an association between scores on the HQ and elevated scores on the HADS noted. Six'symptoms' as most problematic were identified.

Conclusions: The study highlighted symptoms of hyperacusis in TBI patients, providing useful screening questions for future clinical practice, Although small the evidence supports further exploration of the association between hyperacusis and anxiety and depression to aid interventions.

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17. Brain injured people in the sub acute phase: from confusion towards self-management

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Background and aims: In current times of recession there's a great governmental appeal on increasing the self-sustainability of patients in order to decrease governmental aid. The clinical patient should be transformed as soon as possible into a participant in society, being embedded on a base of undisclosed partnership. The current spirit of times stimulates changes of approach and in treatment enhancing self-efficacy and self-control as early as possible within clinical rehabilitation.

Methods: Recently, brain-injured patients in our clinic are daily stimulated to plan activities of their choice in addition to the therapy program, increasing active participation. Apart from their own activities, they are asked to participate in daily activities on the residence section from setting the table for meals to organizing a joint activity. Activities that for short have been provided by the rehabilitation team. Patients can increase their independence in fulfilling the tasks, by gradual reduction of support and supervision by the team. Tailoring interventions to patients' progress in autonomy stimulates their active participation in rehabilitation and in decision making, and would improve patients' preparation for autonomous living after discharge (Proot, 2009). Family is informed about the activating approach and stimulated for follow up, especially during weekend leave. Constant exchange and evaluation of their experiences help tailoring the approach and interventions during clinical rehabilitation.

Discussion: Authors aim for exchange of ideas with visitors of the WFNR14 in realizing a participative climate in the sub acute phase of brain-injured patients, heading for self-management within society in the end.

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18. Brain-computer interface trainings for patients with cortical and subcortical stroke

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Background and aim: An EEG-based brain-computer interface (BCI) provides the on-line control of motor imagery. It can result in functional recovery in post stroke patients. The aim of our study was to investigate the possibility of using the BCI in patients with different stroke location.

Method: Sixteen post-stroke patients entered the study (median age - 51 years old, median time since stroke - 14 months, median ARAT score - 1 unit). During each training a subject sat 1m from a screen that randomly presented visual instructions: to imagine right or left hand grasping or to relax. The EEG was registered with 30 electrodes. We used a Bayesian approach for EEG pattern classifying. The activity sources most relevant for BCI functioning were identified using an independent component analysis. Classification accuracy was measured with Cohen's kappa. Each patient received at least 8 sessions of 40-minutes trainings in combination with standard rehabilitation program.

Results: The patients were able to control the BCI after 3-5 training sessions irrespective of stroke location. The median Cohen's kappa was 0.37 [0.19; 0.43]. BCI control for all subjects was achieved with mu and low beta rhythms modulation. In patients with subcortical damage the sources of EEG-activity were located over the center gyrus area and over the vertex in case of cortical (M1 area) damage. Seven patients got clinical improvement of 2-16 units by ARAT.

Conclusion: Patients with subcortical as well as with cortical damage are able to control BCI but with different sources of brain activity.

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19. "Lost in time and space" following a right thalamic infarct: a challenge for compassion focussed therapy

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Background and aims: Through perception and action, sensory information allows us to interact with, and become anchored in, the world (Bermúdez et al.,1998). The thalamus has been described as the "gateway" to the cortex, as one of its functions is to relay sensory information about the world, body and lower brain centres to the cortex. Unsurprisingly, thalamic lesions can result in a disorientating sense of disconnection from the world and body (Schmahmann, 2003). We aim to discus how such a neurological incident can create a unique clinical challenge and how a compassion focussed therapy approach can enhance the neuropsychological formulation.

Method: We present patient L.D. who, following a right thalamic infarct, experiences reduced sensory perception and an intensely distressing sense of disconnection, in situations that don't provide high levels of sensory stimulation. Compassion Focused Therapy (CFT) suggests internal states of arousal can be governed by three systems, threat system, drive and excitement system and soothing system (Gilbert, 2009). L.D. reported feeling connected to the world when experiencing feelings associated with threat system activation, such as worry or anger. She would actively provoke the threat system to feel connected.

Results: As L.D. experienced profound disconnection when using conventional relaxation and mindfulness techniques, novel strategies were successfully implemented to arouse the self soothing system, whilst providing anchoring proprioceptive or perceptual sensory stimulation**.** Understanding the difference between the threat and drive excitement system promoted use of latter system for feeling connected and reduce threat system reliance.

Conclusions: L.D's reliance on the threat system was reduced through strategies that made her feel connected to the world.

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20. Where did the time go?: A case study investigating the role of the thalamus in the processing of time

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Background and aims: The ability to estimate the passage of time may rely on three components: a clock component, a memory component and a comparison component (Church, 1984). Although many cortical and sub-cortical structures appear to be involved, it is not always clear how. Rare reports of patients with thalamic lesions have documented disorientation in time e.g. to clock time, date or season. Although this suggests the thalamus contributes to time processing, it cannot tell us how. As hippocampal-diencephalic circuitry is critical for new memory formulation, it is likely the thalamus contributes to storage of time intervals.

We report L.D. who consistently misidentified the date, month, year, season and duration of testing session after an anterior medial thalamic lesion. Replicating Shaw and Aggleton's (1994) method, we investigated whether the thalamus is involved in the memory component of the time processing system.

Method: In an interval reproduction task, participants using upside down stopwatches reproduced time intervals demonstrated by the experimenter. In an interval production task, participants produced time intervals stated by the experimenter e.g. 45 seconds. Interval reproduction requires comparison with a previous interval, so relies more on episodic memory (Shaw and Aggleton, 1994). Intervals were filled with stories of varying font and size.

Results: L.D.'s interval reproduction was significantly less accurate than ABI (*N*=5, SINGLIMS <.05) and normal (*N*=5, SINGLIMS <.05) participant's but her interval production didn't differ from ABI (SINGLIMS >.05) and normal control's (SINGLIMS >.05).

Conclusion: The thalamus appears to contribute towards episodic memory in time processing.

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21. Neuropsychological intervention plan in post-stroke patient in the cerebellar region

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Introduction: Functional difficulties are common after stroke. However there are several ways to evaluate those limitations. The International Classification of Functioning, Disability and Health – ICF has the potential to help standardize functional sequelaes and help identifying facilitators for rehabilitation. The aim of this study is to show the cerebellum stroke impact using neuropsychological evaluation and ICF to develop a intervention plan based on the improvement of the quality of life.

Method and results: A neuropsychological evaluation was carried out in a single session. The patient was stroke victim and visually impaired, with the following instruments: MOCA (21/22), BDI (9/63), BAI (8/63), SIS 3.0 (207/320), RAVLT (45/48.2), EXIT (2/30), Vocabulary (50/66) and Digits (14/30). ICF based on evaluation results and information brought by the patient and his wife: b134.2, b210.4, b270.2, b730.2, s110.1, d170.2, d166.4, d460.1, d455.2, d315.4, d 850.4, d870.4, d770.2, d930.0, d920.0, d310.0, e145.1, e155.3, e410+2, e310+3, e325+2. Intervention plan: reading and writing difficulties due visual impairment: Braille learning; mobility at home: use of a grab bar; locomotion in different locations: use of a cane; daily activities: use of an audible alarm watch, packages with different shapes and textures; money control: coin trays; leisure activities: listen the Bible on CD and record the comments for further study; recreation: inclusion in study groups and worship at the church. The formal evaluation was not enough to demonstrate the impact of cognitive impairments, completing the ICF enabled clarification of the health condition and functionality.

Conclusion: The use of ICF as a method of standardized assessment proved to be more sensitive to describe the broad aspect of routines and the impact of the injury in the patient's life, and allow the development of intervention rehabilitation plan and create individualized goal.

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22. The use of International Classification of Functioning (ICF) as a tool in the establishment of goals in a case of Diffuse Axonal Injury (DAI)

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Background and aims: The international classification of functioning (ICF) aims to unify the language and the structure of work-related health status of a person. Defines how components of health-related states welfare from perspectives related to the body, activity and participation. It classifies as a health condition may interfere or disable limit activities and participation of a person in their environment. The aim of this study was to use the ICF as a tool in establishing functional goals neuropsychological intervention in a patient with diffuse axonal injury.

Method: As an instrument we used ICF which is divided into the following areas: functions and body structure, activities and participation, personal factors and environmental factors. The patient, 16-year-old female victim of hit and run; began the intervention after seven months post-trauma.

Results: The ICF data showed that the patient had as a result of injury, body functions: behavior modification; executive functioning, aggressiveness, irritability, loss of memory. Activity and participation: do not leave the house unaccompanied, no leisure, reducing the friendship groups, poor academic performance, relationship troubled with sister.

Conclusion: The elaborate goals started from the original complaint of the patient and family related to the difficulty to control aggression and bad relationship with her sister.

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23. Mental Information Processing and Mental Fatigue In Stroke Patients

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Background and Aims: Fatigue is one of the most frequent and persisting complaints and after stroke and has multiple factors. The Dutch Multifactor Fatigue Scale (DMFS) was recently developed to assess the unique characteristics of fatigue after acquired brain injury. It measures Impact of Fatigue, Mental Fatigue, Direct consequences of fatigue, Physical Fatigue and Coping with fatigue. In the current study, it is investigated whether mental information processing can be related to the Mental fatigue scale of the DMFS.

Method: Thirty six patients with an ischemic stroke in outpatient Neurorehabilitation in the Rehabilitation Center of the University Medical Center Groningen, without premorbid chronic fatigue or current depression, participated in the study. The Dutch Multifactor Fatigue Scale and the Vienna Reaction Test were administered as part of a regular neuropsychological examination.

Results: Side of lesion, chronicity nor educational level were related to fatigues scores. Fatigue after stroke was higher in younger patients and female patients. The simple single mental reaction times on colour and the simple choice mental reaction times on sound/colour were significantly related to the Mental fatigue scale, but not to the other scales of the DMFS. Motor reaction times were not significantly related to fatigue scores.

Conclusions: Mental information processing time in non-depressed stroke patients can be related to mental fatigue as measured by the DMFS. This supports the validity of the DMFS and shows the importance to distinctively measure the different factors of fatigue after acquired brain injury.

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TUESDAY ABSTRACTS are in presentation order

Session 8: Measurement Methods in TBI

Measurement Symposium Part 1: New Assessment Strategies for Measuring Outcome Following Brain Injury

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Background and Aims: Few assessment and outcomes instruments have been developed targeted to individuals with brain injury. For this reason a new comprehensive measurement system (TBI-QOL) has utilized feedback directly from individuals with TBI, their caregivers, and clinicians as well as thorough literature reviews. Large item pools were written in multiple domain areas. Items were carefully reviewed for content, clarity, translatability, reading level, and relevance across different cultures. Poorly written items were removed or rewritten. The final item pools contained 922 items covering multiple domain areas and were fielded tested in 5 TBI Model System centers.
Method: A large sample of individuals with TBI (N=675) completed all items within a domain area. Responses were evaluated using a two parameter (2-pl) Item Response Theory (IRT) model.
Results: Using advanced psychometrics (e.g., 2-pl IRT, confirmatory factor analyses, DIF), poor functioning items were removed and 22 item banks were calibrated as a unique scale and developed as both a computer adaptive test (CAT) and traditional short forms. Content area includes: self-reported cognitive functioning, anger, emotional and behavioral dyscontrol, resilience, depression, anxiety, positive affect, self-esteem, grief, stigma, ability to participate, satisfaction with participation, independence, headaches, fatigue, and pain interference.
Conclusions: Use of CAT testing allows the examiner to obtain rapid and reliable assessments across multiple domains. CAT technology helps focus the assessment so that only items relevant to the examinee's level of functioning are administered and can be done so remotely and scored in real time. The implications for clinical practice will be discussed.
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Measurement Symposium Part 2: Precision, dimensionality, and sensitivity to change in brain injury outcome measures

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Background and Aims: Modern psychometric methods based on item-response theory (IRT) allow for the development of precision self-report and observer rating scales. The aim of this study was to assess the possible advantage of applying these methods to legacy brain injury (BI) outcome scales.
Method: The Disability Rating Scale (DRS) and Functional Independence Measure (FIM) were evaluated using a single parameter IRT (Rasch) model. Item data obtained during 1-20 year follow-up telephone interviews were examined for 406 participants in the TBI Model Systems longitudinal study.
Results: With the addition of an item for actual employment status, the DRS appears unidimensional and shows good Person and Item Reliability/Separation. The new item significantly reduced positive skew; however, sensitivity or coverage across the distribution remained problematic. Parametric logit scores derived from IRT modeling demonstrate greater sensitivity to change than raw scores. Factor analysis and principal components analysis of residuals following Rasch analysis of FIM data reveals at least two distinct dimensions for cognitive and physical functioning. Unidimensional parametric equivalent metrics of each of these domains were derived.
Conclusions: IRT analyses provide unidimensional parametric equivalent measures with increased sensitivity and precision compared to classic summative scores. However, legacy global measures such as the DRS provide inadequate coverage of some ranges in the distribution of outcome. Examination of dimensionality is often neglected in summative legacy scales, essentially resulting in "adding apples and oranges." The advantages of using precision unidimensional measures for clinical practice will be discussed in detail.
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Measurement Symposium Part 3: Aspects of residual symptoms of traumatic brain injury in the post-acute period

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Background and Aims: Early classification of traumatic brain injury (TBI) based on the Glasgow Coma Scale or duration of post-traumatic amnesia has limited implications for clinical management in the post-acute period. This study sought to identify key aspects of residual symptoms that could form the basis for a new classification scheme that can guide treatment.
Method: Community dwelling persons with TBI were administered a battery of tests including the TBI-QOL, other questionnaires, and cognitive tests. Scores on all 38 measures were submitted to variable cluster method using PROC VARCLUS in SAS to identify key aspects of TBI symptoms. To ensure valid results, nine clusters were selected based on the sample size.
Results: Participants were 504 persons with TBI most of whom (70%) had sustained moderate/severe TBI and were male (75%). Average age was 38 years and average time post-injury was 6 years. Review of content of measures comprising clusters indicated that the nine clusters reflected self-reported cognitive impairment, ability to cope with stress, physical symptoms, emotional distress, economic/social support, and post-concussive symptoms as well as objective measures of memory, speed of cognitive processing, and verbal fluency. Each cluster's first component explained at least 60% of the variation of the cluster and all the first components explained 71% of the variability of the 38 questionnaires.
Conclusions: This study reveals key aspects of self-reported and objectively measured symptoms for persons in the post-acute period of recovery from TBI. This is a preliminary step towards creating a classification scheme that can inform treatment.
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Session 9: Acquired Neurological Conditions – Datablitz

Effectiveness of the Restore4Stroke self-management intervention "Plan Ahead!": a randomized controlled trial in stroke patients and partners

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Background: Stroke consequences often restrict patients and partners in their societal participation. Self-management interventions teaching proactive coping may help to reduce their restrictions.

Aim: To study clinical effectiveness of a self-management intervention (SMI) teaching proactive coping compared to an education intervention (EI) in stroke patients and partners.

Methods: In this multi-centre randomized controlled trial we randomly assigned 113 stroke patients and 57 partners to either SMI or EI. Patients' main inclusion criteria were symptomatic stroke (>=6 weeks ago), home living and >=2 restrictions on the according subscale of the Utrecht Scale for Evaluation of Rehabilitation-Participation (USER-p). Measures were at baseline (T0), and directly (T1), 3 (T2) and 9 months post-intervention (T3). Primary measures: Utrecht Proactive Coping Competence scale (UPCC) and USER-p restriction subscale.

Results: Patients' mean UPCC scores did not change after treatment in both the SMI group (T0: 2.9, sd.6; T1: 2.9, sd.6) and the EI group (T0: 2.9, sd.6; T1: 2.9, sd.6) and did not differ between groups. Patients' mean USER-p restriction subscale scores increased in the SMI group (T0: 71.3, sd 15.5; T1: 71.7, sd 14.5) and decreased in the EI group (T0: 73.7, sd 16.7; T1: 72.3, sd 16.6). Partners' mean UPCC scores improved in both the SMI group (T0: 3.1, sd.4; T1: 3.3, sd.5) and the EI group (T0: 3.1, sd.4; T1: 3.3, sd.4). Partners' mean USER-p restriction subscale scores increased in both the SMI group (T0: 86.6, sd 16.0; T1: 91.5, sd 9.2) and EI group (T0: 86.4, sd 14.2; T1: 89.2, sd 11.0).

Conclusions: These preliminary analyses showed that proactive coping improved slightly in partners in both intervention groups but not in patients. Participation restrictions slightly increased in patients of the EI, but decreased in patients of the SMI group and partners of both interventions. Multivariate longitudinal analyses are needed to establish effectiveness.

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Measured and self-reported cognitive functioning in chronic stroke patients one year after admission

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Background and aims: Currently, comprehensive patient-centered measures, like the Stroke Impact Scale (SIS) are used to assess multiple consequences of stroke. The SIS includes one scale assessing cognitive consequences, e.g. memory, concentration and processing speed. The aim of the present study was to investigate the correspondence between the SIS/cognitive scale and neuropsychological measures in chronic stroke patients.

Method: One-hundred-and-two chronic stroke patients (average age 69 years, SD 13, 56% male) underwent neuropsychological assessment (memory and executive function, processing speed, language production, and attention) and answered the SIS.

Results: Preliminary analyses revealed global cognitive impairment (MMSE < 25) in 13% of the patients. Excluding these and defining impairment as a score 1.5 SD below peer norms, 53% of the patients did not show cognitive impairment whereas impairment was found in 33%, 7%, and 5% in one, two and at least three cognitive domains, respectively. 34% of the impaired patients did not report any problems on the SIS/cognitive scale. The sensitivity (correctly reporting cognitive impairment) of the SIS/cognitive scale was 52% while the specificity was 65%. Patients not reporting impairment most frequently demonstrated reduced processing speed (53%) or deficits in memory or executive functioning (33-40%).

Conclusion: Cognitive impairment is common after stroke also over time. Self-reported cognitive function (SIS) may lead to deficits being overlooked. Finding impairment in processing speed as well as executive and memory functions in patients reporting no deficits may suggest that a patient's engagement in complex activities is influenced. Thus, clinicians should be aware of the low sensitivity of the SIS/cognitive subscale.

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Social participation in patients with SAH: Long-term outcome

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Background and aims: Not much is known about long term outcomes of patients with a subarachnoid hemorrhage (SAH). The aim of this study was to describe social participation 3-6 years after SAH and to identify which variables were associated with this outcome in patients with SAH.

Method: Patient- and SAH characteristics were collected and patients completed several questionnaires. Participation was measured with the 'Community Integration Questionnaire-Revised' (CIQ) and Health-Related Quality of Life (HRQoL) with the 'Sickness Impact Profile 68' (SIP68). Coping strategy was measured with the 'Coping Inventory for Stressful Situations' and symptoms of depression with the 'Centre for Epidemiological Studies Depression Scale'. Univariable and multivariable regression analyses were used to study associations between patient characteristics (age, gender, employment, SAH type) and these measurements in relation to participation 3-6 years post onset.

Results: 68 patients were included in the study, 3-6 years after SAH. The mean age of onset was 52.8 years (SD=10.8), 40% were men, 68% was un-employed and the mean participation score was 15.1 (SD=4.4). Significant univariable relations with participation were found for age, employment status, depression, HRQoL and coping strategy. Multivariable analyses showed age (β=-.131; p=.002), HRQoL (β=-.157; p=.001) and the avoidant coping strategy 'social diversion' (β=.218; p=0.025) to have the strongest independent relationships with participation.

Conclusions: Patients with SAH experience fairly good participation. We did not find independent relationships between depression, active coping strategies and participation in this population. This was an unexpected finding as active coping often is considered to be a preferable coping strategy.

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External memory aids for people with multiple sclerosis: A systematic review

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Background and aims: Approximately 40-60% people with Multiple Sclerosis (MS) have memory problems. Evidence supports the use of external memory aids in other patient groups, e.g. brain injury. Previous reviews on memory rehabilitation in MS have only included randomised controlled trials (RCT). The efficacy of external memory aids for people with MS was assessed.

Method: A systematic search was performed, and intervention studies with MS participants were included. Studies were included if they provided training in the use of external memory aids, or as part of a general cognitive rehabilitation programmes, providing they explicitly covered external memory aids. Two 10-point scales were used to rate the quality of each study; one for single case experimental design (SCED) studies (=; Tate et al., 2008) and one for group studies (PEDro-P scale; Maher et al., 2003).

Results: 33 studies were identified and 8 were included. There was one SCED (mean=8 on SCED scale) and seven group studies (mean=4.71 on the PEDro-P scale); five of which were RCTs. One study reported a significant effect of treatment on subjective reports of memory functioning, and one reported a significant effect on mood. No significant effect of intervention was found on objective reports of memory functioning or quality of life.

Conclusions: There was little evidence to support the effectiveness of external memory aids on memory function in people with MS. However there were few studies and methodological quality was generally low. Therefore further high quality trials are needed.

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Effectiveness of a Strategic Executive Training (ReSET) in Parkinson's Disease

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Background and aims: Impairments in executive functions (EF) are predominant in Parkinson's Disease (PD). Hence, effective treatments are sorely needed (Calleo et al, 2012). We aimed to develop a strategic training for executive dysfunction in Parkinson's Disease and to examine its effectiveness. The first results of this study will be presented.

Method: 25 PD patients were randomly assigned to either the experimental Strategic Executive Training (n=11) or to Cogniplus (n=14), a computer training for attention. All patients set three individual executive goals, which were related to daily life executive activities. Neuropsychological assessment was administered at baseline and post treatment. The DEX questionnaire was the primary outcome measure. Goal attainment scaling, the BADS standard age total score (EF) and TMT ratio (attention) were the secondary outcome measures in this study.

Results: At baseline there were no significant differences between groups on primary and secondary outcome measures. Post treatment, both groups showed less executive problems on the DEX questionnaire. Results showed a stronger decline in reported problems for the experimental group, however this trend did not reach significance. The experimental group showed significantly more improvement on their goals when compared to control patients. For both groups no differences were found between baseline and post treatment measurements of EF and attention.

Conclusions: Preliminary results showed that a Strategic Executive Training appears to be more effective for improving daily life functioning than computer training. Both treatments lead to a reduction of executive problems in daily life, however test performances remained unchanged.

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Autobiographical memory rehabilitation in patients with dissociative amnesic disorders and an immigration background

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Background and aims: Dissociative amnesic conditions are occurring with increasing frequency in Western societies. While in some cases spontaneous memory recovery may occur after days or weeks, other cases are resistant to treatment and may remain with their symptomatology for years or possibly even life-long. Recently, we found that dissociative amnesic states are more frequently diagnosed in patients with a background of immigration, a lower socio-economic level, and language problems, compared to individuals born in the respective country and having a stable profession. We therefore studied obstacles and possibilities for memory rehabilitation in this group of patients.

Method: We studied eight patients (age range: 17–54 years; 7 male) with a diagnosis of severe dissociative amnesia and an immigration background neuropsychologically and neuroradiologically and followed their recovery over periods between months and several years. The patients originated from 7 different countries and immigrated to Germany (6), Switzerland (1) and Canada (1).

Results: Seven of the 8 patients had principally major retrograde amnesia in the episodic-autobiographical domain, covering their whole life time; one patient had lasting anterograde episodic-autobiographical amnesia. All of them had (usually) minor deficits in other cognitive and emotional domains. However, they all had a principally preserved semantic memory and had maintained the abilities to read, write, and calculate, and to behave socially adjusted. None of the patients regained their autobiographical past, though they were followed up between 6 months and 6 years. Specific psychotherapeutic treatment was done in only 3 of the patients. This consisted of a mixture of personality stabilization, general supportive psychotherapy and memory training. However, none of the patients regained their autobiographical memories. All other patients refused psychotherapeutic treatment.

Conclusions: Patients with dissociative amnesia and a background of immigration seem to be particular resistant to psychological treatment. They seem to have major problems with a psychiatric diagnosis of their illness. Treatment refusal or treatment ineffectiveness may be the result of problems with having to acquire the language of the guest land and with frustration about a lower socio-economic status compared to that they had had in their country of origin. We propose a comprehensive-holistic neuropsychological rehabilitation approach and a shift *from* focusing on reinstating "lost memories" *to* functional adaptation in everyday life and environment; this will lead to a greater reduction of symptoms, better community functioning and better life satisfaction in patients with dissociative amnesia in comparison to exclusive individual psychiatric treatment or no treatment.

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Session 10: Paediatric Developmental and Neurological Disorders

A novel computational framework for the microgenetic analysis of reading remediation programs

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Background and aims: Reading remediation programs (RRP) aim to promote reading and spelling skills of individuals with reading difficulties. The efficacy of such programs is usually being determined by comparing participants' performance to controls in measures of cognitive, linguistic, reading, and orthographic processing skills at pre-, mid-, and post-intervention assessments. However, no studies exist that investigate the learning progress dynamics during intervention. The aim of this study was to explore the learning dynamics and the developmental stages of the readers during intervention using microgenetic methods and computer applications.
Method: An innovative methodological framework for analyzing microgenetic data obtained from two different computerized RRP (a phonological, *GG:* Graphogame; Lyytinen, Erskine, Kujala, Ojanen, & Richardson, 2009; and a cognitive, *PREP*: PASS Reading Enhancement Program; Papadopoulos, Das, Parrila, & Kirby, 2003) was proposed. 56 Greek-speaking children with reading difficulties, aged 6-7, were randomly assigned to 4-week intervention focusing on cognitive (PREP) or phonological (GG) training or the two combined (PREP-to-GG or GG-to-PREP).
Results: Correlation trace analysis (focusing on the effects of GG) revealed that GG+PREP group showed significant correlation between its performance scores during intervention and its fluency scores (real word reading and phonemic decoding fluency) post-remediation. GG group showed significant correlation between its performance score and phonemic decoding fluency. PREP+GG showed no significant correlation.
Conclusions: Although experimental groups showed notable improvements in their word reading and phonemic decoding fluency scores, significant differences were observed among them in terms of their overall performance. The groups receiving combined treatments resulted in greater remediation effects.
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Comparative Biolinguistics: Investigating verb/noun dissociations in developmental and acquired language disorders

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Background and Aims: Evidence for any particular language disorder can come from either of two sources: (i) structural and/or functional damage to (a) particular brain area(s) related to language or (ii) a complex combination of gene and/or chromosomal mutations and environmental risk factors (see Benítez-Burraco, to appear, for an overview). For example, verb naming deficits in aphasia, dementia of the Alzheimer's type (DAT), and schizophrenia (SCZ) involve damage to left frontal-temporal cortical regions (Kambanaros, 2009; Kambanaros et al., in press and references within). Conversely, SLI, dyslexia, and autism are strongly genetically influenced with a wide range of different genes being associated (Fisher & Francks, 2006; Fisher & Scharff, 2009; Benítez-Burraco, to appear). Similarly, language-impaired children with the above-mentioned conditions have difficulties with lexical knowledge and access (Bishop, 2008), including verb retrieval. It is well known that grammatical class plays a crucial role in language processing. For example, during language production, grammatical class affects all types of errors made by normal and language-impaired speakers. Nouns and verbs are highly variable in meaning. Verbs denote events i.e. what happens to things, including actions, while nouns typically denote entities such as people, animals and objects. Since verb processing requires an understanding of relational concepts, whereas nouns are normally non-relational and only need single object reference, verbs appear semantically more complex. Explanations for this cross-linguistic noun advantage in impairment focus on a number of factors including the variability in verb and noun meanings, the complex relationship between verbs and nouns (e.g., instrumentality, name relation, transitivity), the differing linguistic levels of processing, the neurophysiological substrates supporting verb and noun processing, and methodological issues (Kambanaros, 2009). Potential grammatical word class deficits in language-impaired children and adults have been investigated using picture confrontation naming. Moreover, key psycholinguistic variables, such as lexical frequency, age of acquisition, imageability, picture complexity, and syllable length, may exert a stronger influence than grammatical class per se on action and object naming performances. The aims of this study are to: 1. compare quantitative and qualitative differences for action names across all language-impaired groups and between their control groups respectively; 2. examine naming errors with reference to psycholinguistic models of word processing; 3. establish whether error types differentiate language-impaired children from language-impaired adults; 4. determine effects of lexical/psycholinguistic variables on naming accuracies; 5. link results to genetic mechanisms and/or neural circuitry in the brain
Method: 110 language-impaired participants have taken part in this study so far: four groups each of Greek-speaking children and adults. Specifically, (i) 17 adults with anomic aphasia (5 monolingual, 12 bilingual), (ii) 7 adults with Broca's aphasia, (iii) 20 adults with schizophrenia, (iv) 15 adults diagnosed with DAT, (v) 16 monolingual children with SLI, (vi) 10 bilingual children with SLI, (vii) 10 children with autism, and (viii) 15 children with dyslexia. Each language-impaired group has been matched with a non-impaired control group. The Greek Object and Action Test (GOAT; Kambanaros, 2003) and its Cypriot Greek adaptation (COAT; Kambanaros et al., submitted), designed to assess verb and noun access and retrieval, were used for all populations. Object names are single, concrete inanimate nouns and include manipulated instruments, such as garage tools, garden equipment, kitchen utensils, household items, office and personal implements, used for activities of daily living. Object names were not controlled for gender. All verbs were monotransitive with either simple internal word structures of [root + affix] or more complex ones of [root + affix + affix]. Actions were restricted to past stereotypical roles, that is, a woman is shown performing household activities (e.g. sweeping), for example, and a man is performing more "manly" duties (e.g. hammering). These stereotypical roles depicted in the pictures are deemed to be appropriate for ages and cultural group. All action names correspond either to an instrumental verb (where an instrument is part of the action, e.g. cutting) or to a non-instrumental verb (e.g. climbing). All target nouns in object naming were also items in the noun comprehension task. All target verbs in action naming were also targets in the verb comprehension task. On the comprehension task, the participants were asked to point to the correct photograph from a set comprising the target object or action and the two semantic distracters for each target object or action. For word production, the participants were asked to name the object or action represented in the photograph using one word.
Results: The results of two sub-tests, object/noun naming and action/verb naming for all eight language-impaired groups, will be reported. The results of simultaneous multiple regression analyses

for the errors in action naming compared to the psycholinguistic variables for all language-impaired groups will be reported and discussed in relation to (adult) models of lexical processing (in particular, Levelt 1989 compared with Caramazza 1997) and genetic and/or neurobiological underpinnings (taking our cue from Benítez-Burraco, to appear).

Conclusions: A verb retrieval deficit is common to both developmental and acquired language impaired groups.

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Memory in children with epilepsy: comparison between the neuropsychological screening of Greek-Cypriot children with and without epilepsy

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Background and aims: Recent neuropsychological studies have shown that rolandic spikes could interfere with specific cognitive and behavioral functions in children with Benign Rolandic Epilepsy (BRE). The aim of this study was to determine whether differences on verbal and visual memory skills, on executive abilities and on speed of processing are present at children with BRE when compared with children without epilepsy. Further, to investigate the effects of stimulus presentation modalities on verbal learning performance.

Method: A battery of neuropsychological tests assessing memory skills was given to a total number of fifty subjects, who were all Greek Cypriots, between the ages of 7 and 12 years old. Twenty-six subjects comprised the experimental group (children with BRE) and twenty-four subjects comprised the control group (children without epilepsy).

Results: The results revealed statistically significant differences between the experimental and the control groups for the tasks assessing verbal-auditory memory, visual search, scanning, mental flexibility, executive functions, and visual-spatial sketchpad. The visual memory of the children with BRE, their auditory and visuo-spatial attention span, as well as their speed of processing was not found to be affected. The visual presentation of words resulted in improved learning and recall performance for both groups of children.

Conclusions: The present results support the existence of a working memory deficit in children with BECTS. The findings suggest that the visual presentation of information provided extra support to children with BRE and perhaps facilitated executive control and processing of verbal material in working memory. It is evident that children with BRE are likely to have impairments in their auditory-verbal memory that interfere with their learning process and their academic progress in the school setting.

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Session 11: Considerations in Assessment and Rehabilitation - Datablitz

Coping, executive functioning, and psychosocial functioning of individuals with severe neuropsychiatric symptoms after acquired brain injury

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Background and aims: Research studies on coping after ABI mainly focus on individuals whose most prominent symptoms are motor or cognitive. Patients with severe neuropsychiatric symptoms after ABI are often excluded from these studies. However, these patients often have trouble reintegrating in the community and require long-term care and support. Our aims were to examine the relationships among executive functioning, coping, depression, and quality of life in these individuals.

Method: Individuals in the post-acute and chronic phase (> 3 months) after ABI with severe neuropsychiatric symptoms were recruited from consecutive admissions to outpatient clinics of four mental health centers in the Netherlands. Patients completed the Utrecht Coping List, Patient Health Questionnaire, Life Satisfaction Questionnaire, Trail Making Test, Stroop Color Word Test, and the Frontal Systems Behavioral Scale.

Results: Ninety-three patients participated in this cross-sectional study. Executive impairment was not associated with coping or outcome ($p > .05$). However, self-reported executive dysfunction predicted the use of passive coping styles ($\beta = .37, p < .01$), and passive coping, in turn, predicted lower quality of life ($\beta = -.57, p < .001$). In addition, among participants who reported executive dysfunction in daily life, only those individuals who also reported high use of active coping styles experienced low quality of life ($\beta = -.94, p < .05$).

Conclusions: Individuals who subjectively report executive deficits in daily life often rely on the use of passive coping styles, which are maladaptive. In comparison, active coping strategies may be maladaptive for individuals who report high levels of executive dysfunctioning in daily life.

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Long Term Users of a Paging System: How do they differ from typical users of this service?

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Background: In 2003 we reported a paging system to reduce the everyday memory and planning problems of survivors of brain injury. A ten year follow up study (2011) compared the first cohort (N=40) with a later cohort (N=40).

Aim: To discover how those using the service for more than 5 years, differed from typical users.

Method: We analysed the characteristics of 11 long term (LT) users and compared these to previous cohorts.

Results: The mean length of time for service use was 1.06 years (first cohort) and 3.4 years (second cohort). The eleven LT users, 7 of whom were male, used the service for a mean of 9.45 years (range 5-13 years). There were no significant differences in age, or time between insult and use of the service. More LT users were female (36% versus 25% and 20% in previous cohorts). Fewer of the LT users had sustained a traumatic brain injury (27% compared to 32.5% and 37% in earlier cohorts) and, of course, there was a difference in the length of time the service was used. For all users, reminders about medication, food and orientation were the most frequent messages sent. LT users were more likely to require messages to do with finances and less likely to require messages about rest.

Conclusion: Some survivors of brain injury require this clinical service for years. These are less likely to have sustained a TBI and to need reminders about rest and more likely to need reminders about finances than typical users.

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Does a regular Wessex Head Injury Matrix (WHIM) assessment predict infections in low awareness patients?

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Background and aims: Brain injury victims are considered to be at high risk for infections. It has been noted that a decrease in WHIM scores, in low awareness patients, may precipitate an infection. This study set out to investigate whether infections in such patients can be predicated with regular WHIM assessments.

Method: This retrospective study looked at the WHIM scores of 16 patients who were diagnosed as being in a low awareness state following brain injury. Seventy one infections were observed in this group (47 infections of the lower respiratory tract, 24 urinary tract infections).

Results: The results of this study indicated that WHIM scores decreased due to infections in 36 of the infection cases. In 35 of the reported infections there was no change in WHIM scores. A decrease in WHIM scores was also noted on 10 occasions within the patient group due to other reason such as medication or dehydration.

Conclusions: There are limitation to this study, in particular small sample size, the homogenous nature of the patients and irregular timing of WHIM assessments. However it does highlight that infections in such a population might be picked up on WHIM assessment prior to physiological changes which would enable more timely medical intervention. The findings of this study highlight the importance of regular WHIM assessments throughout the period of recovery not only to measure cognitive change but also to highlight underlying physical changes such as infections that will impact on rehabilitation and recovery. Further investigation is imperative.

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Rare and unusual syndromes: A follow –up study

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Background and aims: At the tenth international meeting of the Special Interest Group in Neuropsychological Rehabilitation in Maastricht 2013, Wilson presented a talk on "Rare and Unusual Syndromes you have probably never heard of but might encounter one day". Five patients were presented who had a confirmed or queried diagnosis of a rare syndrome were referred for assessment. The syndromes were: (1) *Fatal Familial Insomnia (FFI), (2) Alexander's Disease, (3) Evan's Syndrome, (4) Diogenes Syndrome, and (5) Cerebral Salt Wasting Disease.* The aim was to determine whether these five people had changed over the course of a year

Method: Four of the five patients were reassessed. The fifth, the woman with a possible query of Fatal Familial Insomnia, had moved overseas and was lost to follow up.

Results: The man with Evan's Syndrome and the woman with Alexander's Disease had deteriorated. The former had developed pneumonia and was admitted to hospital. On his return to the rehabilitation hospital, his cognitive problems had worsened. The woman with Alexander's Disease had also been admitted to hospital after numerous seizures. When she returned to the rehabilitation hospital she was much less responsive. The man with Diogenes Syndrome (Senile Squalor Syndrome) had been admitted to slow stream rehabilitation but, cognitively, had not changed. The man with Cerebral Salt Wasting Disease remained in a similar low responsive state unchanged since the original assessment.

Conclusion: Severely brain injured people are susceptible to infections which, in turn, may result in cognitive deterioration

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Examining the factors of the Psychiatric Diagnostic Screening Questionnaire (PDSQ)

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Background and aims: The goal of this study is to examine the psychometric properties of the Psychiatric Diagnostic Screening Questionnaire (PDSQ; Zimmerman, 2001) in the Cypriot population; the seven sub-scales examined are: major depression, generalized anxiety disorder, panic disorder, agoraphobia, social phobia, hypochondriasis and somatization disorder.

Methods: Three hundred and seventy participants took place voluntarily in this research (207 female, 143 male) between the ages of 18 and 69 years (M= 42.28, SD= 13.37).

Results: A total of 357 completed questionnaires were obtained. The total PDSQ examined proved to have high internal consistency (α=.94) and each sub-scale's internal consistency was also > .7. The seven scales were factor analyzed using principal component analysis with Direct Oblimin (oblique) rotation. The KMO statistic was .833and Bartlett's test was significant ($p < .000$). Kaizer's criterion indicated two components, which explained 64.2% of the variance. The first component includes the scales of social anxiety, agoraphobia, depression, panic disorder scales and generalized anxiety disorder. The second component includes hypochondriasis and somatic disorder.

Conclusion: The PDSQ scales appear to be reliable in their Greek translation and measure meaningful aspects of psychopathology. The can be reduced into two dimensions: The first can be named the "Negative Affect Disorders" as its factors relate more to negative feelings and thoughts for various situations. The second component's scales mostly relate to symptoms pertaining to somatic health and somatic reactions, such as, worrying for one's health, pain and fear; therefore, they can be named as "Somatic Disorders".

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Session 12: CVA NeuroRehabilitation

Relationships between problem solving skills, depression and health-related quality of life during outpatient rehabilitation for stroke

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Background and Aims: The aim of this study was to investigate the relation between problem solving skills, depression and health-related quality of life (HR-QoL) in a population of patients in outpatient rehabilitation treatment for stroke.

Method: Stroke patients were recruited from two rehabilitation centers. Problem solving skills were measured using the short version of the Social Problem Solving Inventory-Revised, which measures Positive Problem Orientation (PPO), Rational Problem Solving (RPS), Negative Problem Orientation (NPO), Impulsive/Carelessness Style (ICS), and Avoidance Style (AS). Depression was measured using the Center for Epidemiologic Studies Depression Scale. For HR-QoL the two domains of the Stroke Specific Quality of Life Scale were used (Psychosocial and Physical HR-QoL). Independent samples t-tests and multivariable regression analyses were performed.
Results: 166 patients were included, with a mean age of 53.06 years (SD 10.19). 53% were men, the mean time post stroke was 12.52 months (SD 23.19). Depressed patients made less use of PPO (p=.002), and more use of NPO (p=.000) and AS (p=.000), compared to non-depressed patients. Depression score was negatively related to both domains of HR-QoL (Psychosocial (β=-.062; p=.000), Physical (β=-.021; p=.000)). PPO was positively related to Psychosocial HR-QoL (β=.108; p=.021), adjusted for depression.
Conclusions: Depressed patients used different problem solving skills compared to non-depressed patients. Problem solving skills and depression were independently associated with Psychosocial HR-QoL in patients in outpatient rehabilitation for stroke. This study suggests that Problem Solving Therapy in the rehabilitation phase for stroke may lead to improvements in both depression score and psychosocial HR-QoL.
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Cognition and participation contribution to Return to Work 3 month after first ever mild stroke

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Background and aims: there are few studies regarding returning to work (RTW) after a mild stroke. This population is not referred to rehabilitation services nor does it receive any kind of guidance in the process of returning to work. The aims of the study were 1) to compare among people who worked before the event, those who RTW to those who did not, 3 month post mild stroke on cognitive, executive functions and participation and Quality of Life (QoL); 2) to explore the unique contribution of these variables to RTW.
Method: The analysis included 163 participants (117 men, 71.8%) 3 months post-mild stroke at home. Mean age was 63.75 years (SD=7.7), years of education 13.2 (SD=3.9); NIHSS scale 2.7 (SD=2.2). The sample was part of the Tel-Aviv Brain Acute Stroke Cohort Project (TABASCO). Instruments included measures of cognition, executive functions (EF), participation and QoL.
Results: 114 participants (69.9%) RTW; mean age was 63.81(SD=7.48); and mean years of education 13.67 (SD=3.91). There were no age differences between the groups but there were significant differences in years of education (t=-2.57, t<.011), and no differences for gender. Significant differences at (p<.02 to .000) and high Effect Sizes were found between the groups on all cognitive, EF, participation and QoL measures. Logistic regression shows that cognitive variables contribute significantly and even more participation and QoL (p<.000) to RTW.
Conclusions: Importance of cognition and participation to RTW after a mild stroke was found which further provides the rational for developing therapeutic interventions to enable RTW.
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Psychological determinants of subjective cognitive complaints 2 months post stroke

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Background and aims: Subjective cognitive complaints are common after stroke and are not closely related to objective cognitive performance. Possibly, psychological factors play a major role. The aim of this study was to investigate which psychological factors are related to post-stroke subjective cognitive complaints, taking into account the influence of demographic and stroke-related characteristics, cognitive deficits and emotional problems.
Methods: Prospective cohort study in which 350 patients were assessed at 2 months post stroke, using the Checklist for Cognitive and Emotional consequences following stroke (CLCE-24) to identify cognitive complaints. Psychological factors were: proactive coping, passive coping, self-efficacy, optimism, pessimism, extraversion, and neuroticism. Associations between CLCE-24 cognition score and psychological factors, emotional problems, cognitive deficits, demographic and stroke characteristics were examined using Spearman correlations and multiple regression analyses.
Results: Two months post stroke, 270 patients (68.4%) reported at least one cognitive complaint. Age, sex, presence of recurrent stroke(s), comorbidity, cognitive deficits, depressive symptoms, anxiety, and all psychological factors were significantly associated with the CLCE-24 cognition score in bivariate analyses. Multiple regression analysis showed that psychological factors explained 34.7% of the variance of cognitive complaints independently, and still 8.5% (p<0.001) after taking all other determinants into account. Younger age, poor cognitive functioning, more depressive symptoms and less proactive coping were independently significantly associated with more cognitive complaints, together explaining 52.3% of the variance.
Conclusion: Cognitive complaints are common after stroke and are associated with age, cognition, proactive coping and depressive symptoms. It is important to focus on these factors in rehabilitation programs.
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Neurologically-focussed early intervention service improves quality of life in survivors of a cardiac arrest

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Background: Cardiac arrest may lead to cognitive and emotional problems and a reduced quality of life. We developed a brief nursing intervention to detect cognitive and emotional problems, provide information and support, promote self-management, and to refer to specialised care if necessary. This study examined its effectiveness.
Methods: Multicentre single-blind randomised controlled trial with measurements at two weeks (baseline), three and twelve

months (endpoint) after the cardiac arrest. Primary outcome measures were participation in society (Community Integration Questionnaire) and quality of life (SF-36 and EuroQol VAS) of the patient at one year. Secondary outcome measures were cognitive functioning, emotional state, extended daily activities and return to work, as well as quality of life, strain and the emotional state of the caregiver. Data were analysed using 'intention to treat' linear mixed model analyses. This study is registered with Current Controlled Trials, number ISRCTN74835019.

Results: 185 adult cardiac arrest survivors and 155 caregivers were included. Patients in the intervention group had a significantly better quality of life at one year compared with control group patients on SF-36 domains Role Emotional (estimated mean differences (EMD)=16.38, p=0.006), Mental Health (EMD=6.87, p=0.003) and General Health (EMD=8.07, p=0.010), but there was no significant difference with regard to participation in society. On the secondary outcome measures, patients in the intervention group scored significantly better on overall emotional state at one year (HADS total, EMD=-3.25, p=0.002) and anxiety (HADS anxiety, EMD=-1.79, p=0.001). Furthermore, at three months more people were back at work (50% versus 21%, p=0.006), but at 12 months the difference had disappeared (p=0.734). No significant differences on caregiver outcomes were found.

Conclusions: The outcome for cardiac arrest survivors can be improved by a service focused on detecting and managing the cognitive and emotional consequences of a cardiac arrest.

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Session 13: TBI Rehabilitation

Changes in Functional Brain Activation Following Brief Goal Management Training with Implementation Intentions: an fMRI Study

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Background and aims: Everyday life frequently involves management of multiple goals and tasks that cannot be executed until some point in the future (i.e. Prospective memory; PM). The rostral prefrontal cortex approximating Brodmann area 10 (BA10) has been suggested to play a key role in PM and is a common site of injury following brain injury. Both Goal Management Training and Implementation Intentions have been found to improve performance on tasks requiring PM. Although studies have reported functional changes in brain activity using fMRI following physical or cognitive training interventions, changes associated with prospective memory training remain understudied. This study examined training related functional changes in the brain following brief prospective memory (PM) training in neurologically healthy individuals.

Method: Twenty seven young neurologically healthy adults were randomised into either brief Goal Management Training with implementation Intentions (GMTii) or a control training condition and completed a computerised PM task while undergoing functional magnetic resonance imaging (fMRI) before and after the brief training.

Results: Following training, the GMTii group showed significantly greater improvement in PM task performance compared to controls. Group x Time interaction revealed significant increases in activation in the lateral Brodmann area 10 and concomitant decreases in medial BA10 in the trained group.

Conclusion The findings suggest that brief GMTii can result in detectable changes in the underlying neural activations within the dorsolateral and medial prefrontal cortex. The findings are discussed in relation to theories of prefrontal cortex functioning and the role the dorsolateral prefrontal cortex may play in PM.

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Light therapy for fatigue following traumatic brain injury

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Background and Aims: Fatigue is a common, persistent complaint following traumatic brain injury (TBI). Effective treatment is not well established. This study aimed to investigate the efficacy of 4 weeks of light therapy for fatigue in patients with TBI.

Method*:* We undertook a randomized, placebo-controlled study of 4-week, 45min/day, home-based treatment with short wavelength (blue) light therapy compared with yellow light and a no treatment control group [n=10 per group] in patients with TBI who self-reported fatigue and/or sleep disturbance. Assessments of fatigue and secondary outcomes (self reported daytime sleepiness, depression, sleep quality, and sustained attention) were conducted over 10 weeks at baseline (week -2), mid-way through and at the end of light therapy (weeks 2 and 4), and 4 weeks following cessation of light therapy (week 8).

Results*:* After controlling age, gender and baseline depression, treatment with high-intensity blue light therapy resulted in reduced fatigue and daytime sleepiness during the treatment phase, with evidence of return to almost baseline levels 4 weeks after treatment cessation. These changes were not observed with lower-intensity yellow light therapy or no treatment control conditions. There was also no significant treatment effect observed for self-reported depression or psychomotor vigilance performance.

Conclusions*:* Blue light therapy appears to be effective in alleviating fatigue and daytime sleepiness following TBI and may offer a non-invasive, safe, and non-pharmacological alternative to current treatments.

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Prevalence and Types of Sleep Wake Disturbances in Closed Head Injury Rehabilitation Inpatients

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Background and Aims: The prevalence of sleep problems is high in head injury (HI) patients. Previous research suggests that HI patients with sleep problems require longer stays in rehabilitation units and that arousal disturbance disrupts engagement with rehabilitation activities. The present study explored the prevalence and types of sleep problem in patients with severe HI undergoing inpatient rehabilitation and whether sleep problems affect rehabilitation.

Methods: Actigraphy, a semi-structured sleep interview, and validated sleep measures were used to identify sleep problems (N=30). Information on rehabilitation, including percentage of goal achievement, frequency of aggressive behaviour, and engagement was collected retrospectively from staff and rehabilitation notes. Relevant factors including daytime sleepiness, fatigue, mood, and pain were explored.

Results: Twenty participants (66.7%) had sleep problems, of which 15 (50%) met diagnostic criteria for a sleep disorder. Sleep disorders in the sample were insomnia 26.7% (n=8), post-traumatic hypersomnia 6.7% (n=2), delayed sleep phase syndrome 10% (n=3), irregular sleep-wake pattern 3.3% (n=1) and periodic limb movement 3.3% (n=1). Two participants met diagnostic criteria for rhythmic movement disorder 3.3% (n=1) and for sleep apnoea 3.3% (n=1) in addition to a diagnosis of insomnia. Five participants (n=5; 16.7%) had poor sleep quality (based on the PSQI>5 and clinical interview) without meeting diagnostic criteria for a sleep disorder. Sleep quality was not significantly associated with rehabilitation variables, but was estimated by senior staff as interfering with rehabilitation in 26% of the sample. Poor sleep quality was associated with greater anxiety, fatigue, and daytime sleepiness.

Conclusions: The majority of head injury patients had sleep problems based on actigraphy and validated sleep measures. Sleep problems may negatively affect the rehabilitation process and patients' wellbeing. However, the current study was not sufficiently powered to detect significant associations between sleep and rehabilitation outcome.

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Online Emotional Regulation Group Treatment for Individuals with Traumatic Brain Injury: Increasing Access to Healthcare

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Introduction: Access to healthcare is a significant barrier to rehabilitation for individuals with traumatic brain injury (TBI). Given the need for life-long services to promote functional, vocational and social recovery, developing innovative interventions to address these barriers is imperative. Telerehabilitation is a promising approach to increasing access to care. This study was designed to assess the feasibility of delivering an emotional regulation intervention (EmReg) as a group treatment using web-based videoconference. The results of a pilot study and progress on an ongoing trial are presented

Method: Seven adults with mild to severe TBI completed a pilot study in 2012. Eighty more participants will be recruited from 2013 to 2017. Participants receive 24 biweekly one-hour sessions of EmReg. Qualitative and quantitative data including attendance, participation, interpersonal interaction, homework completion, skill acquisition, generalization, ease of use of technology, emotional regulation, problem solving, positive and negative affect, and satisfaction with treatment are collected using online data collection services. A pre-post within subject design will be used to analyze results.

Results: Participants in the pilot study attended 93% of all available sessions. They did not report major technological difficulties. Skill acquisition was variable, and participation and quality of group interactions increased over time as familiarity increased. Over 95% of the assigned homework was completed. While outcome data will not be available until the completion of the main study, up-to-date clinical observations in terms of recruitment, delivery, and participation will be presented.

Conclusions: This is the first study exploring the viability of online group treatment for individuals with TBI, with therapists and group members in multiple remote locations. Implications for increased access to healthcare are discussed.

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Poster abstracts - Tuesday

24. Treatment of memory retrieval and word production in Dementia using Cognitive rehabilitation

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Background and aims: Deterioration in memory and in cognitive functions is often the hallmark of dementia that leads to impair independent living and substantial distress on the caregivers. Currently the prevalence of dementia is estimated to be about 26.6 million and in the USA alone the care for the over 4 million affected is over $100 billion annually Ramirez, Gao &Black, 2008 and unfortunately this keeps raising. Cognitive rehabilitation involves many activities that eventually lead to improving daily living. There had been conflicting results on the use of this array of activities to bring back memory and where the cognitive rehabilitation had been proven effective, procedure had been flawed. The aim of this study is to treat cognitive and word formation in a adult dementia patient with a manualized cognitive rehabilitation.

Method: Dementia was evaluated using a CT scan and the neurologist confirmed and assessed the patient. The first diagnosis was >1 yr. The client was seen 24 times over 2 months, the first contact with patient was assessed with MMSE and the same instrument was used for evaluation every 2 weeks, while for words production, ability to start a story line from beginning to the end with timer was used. Testing of patient occurred 6 times. Time-1 MMSE score of 2/storyline time<60secs, Time-2 MMSE score of 5/ storyline time <2mins, Time-3 MMSE score of 12/storyline time >5 minutes, Time-4 MMSE score of 18/story line time >5 minutes and Time-5 MMSE score of 18/storyline time >5minutes.

Results: Manualized cognitive rehabilitation for the dementia was for 3 times weekly spaced over two months, changes in the MMSE scores were significantly increasing and peaked at the beginning of the second month, between the second and fourth cluster of assessment was the most prominent changes in cognitive functioning.

Conclusions: Patients with dementia despite long term history of loss of memory can be helped to gain significant control over their life and relieve their distress which invariable increase quality of life by using some processes in cognitive rehabilitation which are less expensive but intensive.

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25. Prevalence and severity of depression following TBI: A meta-analysis comparing different measures, samples and time-intervals

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Background and aims: Depression is common following a traumatic brain injury (TBI), however prevalence estimates vary widely between studies, limiting their clinical usefulness. The reasons for this variability are not well understood. The current study was designed to examine the impact of a variety of methodological variables and sample characteristics on the prevalence and severity of depression following adult TBI.

Method: Data from 98 studies that examined depression following TBI, either in terms of clinical cases or scores on a depression scale, were analysed. The impact of a number of variables were examined, including: the measure used, diagnostic criteria, method of administration (self-report scales), psychological and

TBI history, injury severity, time post-injury, and the comparison group.

Results: Overall, 36% of people experienced clinical levels of depression post-injury, compared to 18% of controls. The prevalence estimates varied considerably when data were partitioned according to the above variables. Specifically, clinical interviews yielded lower estimates than self-report measures (29% vs 39%), and mild TBI had lower rates than severe TBI (33% vs 38%), although these differences were not significant. In addition, prevalence rates increased steadily for the first five years post-injury (26% to 45%), then decreased slightly (38%), with the acute (< 6 mths) and medium-term (2 – 5 yrs) time periods differing significantly.

Conclusions: Depression is very common post-TBI, but the prevalence rates can differ substantially, depending on the method by which it is assessed, patient characteristics, and the samples that are used to determine the base-rates of depression.

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26. "If I start doing that I'll never get my memory back…….."

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Background and aims: In an earlier qualitative study we found people with memory problems due to ABI had several common concerns about using memory aids e.g. whether the aid would fit their lifestyle and concerns arising from mistaken beliefs. In the current study we explore whether these are as important as demographic/injury variables and awareness in predicting uptake of strategies. We developed a new questionnaire (Beliefs about Memory Strategies Questionnaire; BMQ) based upon the qualitative themes and placed these in a regression alongside demographic variables and awareness.

We follow this with a single case design using 'Google Calendar' with a man who was initially unwilling to use any aid.

Method: 58 participants with memory difficulties due to ABI provided demographic data and completed: a list learning task; the Revised Everyday Memory Questionnaire (with participant vs significant other score to measure awareness); the BMQ (five subscales), and a memory strategy questionnaire (dependent variable).

Our single case design across different memory slips involved a 43yr old man (JA) with verbal and visual memory difficulties and executive problems.

Results: Regression analysis showed the combined demographic variables and awareness contributed little to the variance in use of strategies (Adjusted $r^2 = .024$). When beliefs were added almost 50% of the variance was explained (Adjusted $r^2 = .497$).

JA showed: a change in beliefs, a significant improvement on target memory slips and no change in a control problem.

Conclusions: Whether an aid suits one's lifestyle and personal values is the most important predictor of strategy use. A collaborative approach, also addressing potentially unhelpful beliefs about memory, is also crucial.

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27. Family intervention in a community neuropsychological rehabilitation setting

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Background and aims: Few studies examine the efficacy of family intervention after acquired brain injury. The existing evidence base is based on studies which document the long-term impact of brain injury on the family (Oddy,2003). It has been suggested that family intervention in neurorehabilitation is a team approach, capturing a wide range of contact with relatives. We discuss how family intervention is implemented in a community neuropsychological rehabilitation setting.

Method: Relatives participate in the rehabilitation programme in vatious ways. Initial contacts include an interview and attending family days, followed by regular contact with a key worker, progress and outcome meetings, home visits, an Understanding Brain Injury day and Understanding Brain Injury day for child relatives. At a later stage, clients and families who have identified concerns are able to have family or couples therapy sessions. The aims of the interventions are to develop a shared understanding of the impact of the brain injury; provide support and facilitate mutual support between relatives. Client feedback is obtained informally and through feedback forms.

Results: Relatives feedback after family days is positive. Informal verbal feedback is mixed with some families finding the contact beneficial and others less so.

Conclusions: Despite the positive feedback, this is preliminary report and future studies need to be more rigorous. However, we support the idea of approaching each contact with the family as an intervention, as congruent with a holistic approach and maximising the impact neurorehabilitation professionals can make on the family's experience of rehabilition.

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28. Emerging from the minimally conscious state (MCS) - What does art therapy offer?

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Background and aims: Although there are a few state registered art therapists practicing in the field of neuro-rehabilitation, as far as we know there is no literature about art therapy being used for patients in a minimally conscious state (MCS). At the Raphael Medical Centre, a private neuro-rehabilitation hospital, art therapy is part of the rehabilitation programme and is given to patients in a MCS. The aim of this study is to discover what functional behaviours are seen in art therapy with patients emerging from the MCS.

Method: Patients emerging from the MCS are operationally defined, for the purposes of this study, as those whose highest recorded score on the Wessex Head Injury Matrix (WHIM) is between 27 (able to ignore distraction) and 52 (uses one or two gestures).

This was an observational study with two patients emerging from the MCS.

Patient A –sustained a traumatic brain injury resulting in an acute subdural haematoma followed by a craniotomy.

Patient B - sustained multiple basal skull fractures, facial fractures and petechial haemorrhages in the brainstem and corpus callosum.

Results: The following functional behaviours of patients were observed during art therapy sessions: 1.hold a paint brush 2. dip brush into a jar 3. move the brush following the therapists verbal instruction, such as 'to paint a curve' 4. Move the brush with volition.

Conclusions: This study discusses the importance of Art Therapy in providing stimulations and monitoring the psychological, cognitive and physical state of these very impaired patients.

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29. A possible new methodology for evaluating patient responses to a form of movement therapy

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Background and aims: There are a wide range of movement therapies and for this paper Eurythmy Therapy (EYT) was chosen. **EYT was developed** by Rudolf Steiner in 1921. It can be described as an active exercise therapy, involving cognitive, emotional and volitional elements.

This paper aims to give a patient perception of Eurythmy Therapy and its perceived benefits and to use this information as an aid in creating an outcome measure.

Method: This study used data obtained from a semistructured interview with a woman of 71 years diagnosed with Guillain-Barre Syndrome. As a result she was wheelchair bound with almost no voluntary movement capacity from the neck down. The interview was transcribed and analysed using thematic analysis. The results are presented with short excerpts from the participant.

Results: There was good inter coder reliability and five themes were identified: Body Awareness, Energy, Movement, Spirituality and Collaboration. For example, under the theme of increased Energy, the patient identified positive change in fatigue levels as a direct result of breathing exercises learned through EYT.

Conclusion: The interview showed that the patient firmly believed EYT had a positive impact on her rehabilitation. Further interviews with other patients will be conducted in an attempt to use this methodology to create a self report outcome measure.

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30. The analysis of slow-stream inpatient neurorehabilitation outcomes using FIM+FAM(UK)

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Background and aims: The Functional Independence Measure (FIM) and the Functional Assessment Measure (FAM) are widely used in brain injury rehabilitation. These measures are divided into two broad domains of functioning (motor and cognitive). All patients attending a multidisciplinary slow stream rehabilitation service in the south of England are assessed with the FIM and FAM (UK versions) on admission and again after six months. The aim of this study was to determine if the functional outcomes (as measured by the FIM and FAM)of adults attending this service, improved over a six month period.

Method: A retrospective audit was carried out of all admissions over a two-year period (2011-2013). Ten patients receiving three or more therapies were selected for inclusion in the study. We compared their FIM/FAM scores on admission with the scores after six months.

Results: There were significant improvements in motor (6.6 point change), cognitive (6.6 point change) and composite FIM/FAM scores (6.2 point change) reflecting reduced functional dependence following slow stream inpatient neuro-rehabilitation.

Conclusions: The FIM+FAM (UK) measure demonstrated sensitivity to change across functional domains relevant to goal directed Slow stream inpatient interdisciplinary neuro-rehabilitation.

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31. Seeing red: Relearning to read in a case of Balint's Syndrome

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Background and aims: Balint's Syndrome is a rare condition, often associated with hypoxic brain damage. The major characteristic is an inability to localise objects in space, another is simultanagnosia frequently resulting in reading difficulties. We present RN, a 37 year old woman whose major problem with reading was her inability to recognise individual letters correctly in either lower or upper case. We noted, however, that she was better if the letters were shown in red type. The aim was to determine if RN could relearn letters of the alphabet, investigate whether colour affected her ability to learn and if the red type also helped her to read words.

Method: Using a single case experimental ABA design, we first determined that the optimal font for RN was size 16. In the baseline (A) phase, we assessed her ability to read all lower and upper case letters of the alphabet in black ink. In the intervention (B) phase we used font size 16 in red ink and an errorless learning approach to teaching the letters. Sessions ran 5 times per week (20 minutes per session). The intervention was then applied to word reading with two sets of 10 words

Results: A significant difference was noted between initial baseline and intervention. Improvement carried over when we returned to baseline with RN recognising 24/26 letters and 19/20 words.

Conclusion: Using red type and an errorless learning approach enabled RN to re-learn letters of the alphabet and read words she was previously unable to read.

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32. Differences of attention component dysfunction in children with neurological disorders help rehabilitation planning and predict outcome

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Introduction: Attention impairment commonly accompanies traumatic brain injury (TBI) and partial epilepsy (PE). A key principle of intervention supports training specific components of attention (Sturm et al., 1997). In this model attention is divided into four hierarchical components: sustaining, focusing, complex, tracking. Our aim was to compare attention deficit at baseline performance and progress during rehabilitation between TBI and PE groups. This could help planning a process- and diagnosis specific training.

Method: 3 children with PE (M=11.19 yrs), 5 with mild TBI (M=11.07 yrs) and 18 controls (M=10.69 yrs) participated. Patients received individual supervised computer-based attention training using FORAMENRehab software, adapted for children by authors. Trainings occurred twice a week during 5-week-period with baseline testing before and after.

Results: Kruskal-Wallis test revealed diagnosis specific attention difficulties. Patients with mTBI were worse in focusing attention to auditory stimuli [χ2=10.749;df=2; Mean rank1(mTBI group)=21.70, Mean rank2(PE group)=19.33, Mean rank3(controls)=10.25, $p<0.05$)]. However, patients with epilepsy had more difficulties with complex attention as trend showed that in Paced Search with Dual Targets task epilepsy group made more mistakes (Mr2=9.67) than children with mTBI (Mr1=5.33) or controls (Mr3=4.80) ($\chi 2=5.261$;df=2; $p=0.072$).

Diagnosis specific differences were associated with further progressing patterns. MTBI group reached complicated levels in complex, sustained and tracking functions quicker, except in focusing attention.

Conclusions: We found that baseline tasks effectively described different structures of attention difficulties in both groups, thus being diagnosis specific. Process-specific rehabilitation significantly improved attention deficit. Besides, children with epilepsy need longer training than children with mTBI in most attention functions.

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33. Don't touch me! Rhythmical Massage Therapy (RMT) for pain management in a patient with acquired brain injury

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Background and aims: Treatment of pain is especially difficult for patients with an acquired brain injury (ABI) and with severe cognitive impairment. Patients in this condition have an altered perception and understanding of pain and are often unable to distinguish between different sensory stimuli. Their pain threshold can be exceptionally low; they may be hypersensitive and experience global undifferentiated response to pain. The aim of this study was to determine whether Rhythmical Massage Therapy (RMT) is effective in pain management

Method: This single case study was with a 50 year old female, O.F who sustained a hypoxic brain injury. On admission she demonstrated hypersensitivity to sensory stimuli and was in consistent pain. She was anxious and confused. We used a single case experimental AB design where A=baseline (treatment as usual) and B = RMT. We administered pain assessment tools including a body map (to indicate location) and the Wong- Baker Faces Pain Rating Scale. The patient also responded to qualitative pain description words.

Results: Following intervention, measurements indicated that O.F's levels of hypersensitivity, anxiety and confusion were reduced. She had a better perception of, and was able to describe, her own pain.

Conclusion: The results suggest that RMT might have an important part to play for pain management following ABI, although further research is needed.

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34. Can Oil Dispersion Bath (ODB) with Valerian Oil be used as a treatment for sleep disturbance in carers of patients with an Acquired Brain Injury (ABI)

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Background and aims: Caring for patients who have sustained an ABI can have a significant effect on the health and wellbeing of the carer. One particular issue affecting wellbeing of carers can be sleep disturbance due to underlying psychological issues associated with caring. Valerian root and the essential oil extracted from this root to treat an extensive range of illnesses including sleep disturbance and psychological issues. One way of using Valerian is in an ODB therefore the aim of this study was to investigate whether ODB can be a treatment for people that have sleep disturbance.

Method: A single case experimental ABA design was used. A carer from a neurorehabilitation unit who reported sleep disturbance was recruited. The carer was treated using an ODB with Valerian 6 times over a 3 week period. Vital signs including blood pressure and pulse were monitored. Psychological status and the effect of sleep disturbance were evaluated at baseline, during intervention and at follow up using the HADS (Hospital Anxiety and Depression Scale) and the Epworth Sleepiness Scale (ESS).

Results: The results of this study indicated blood pressure and pulse reduced as did the scores on the ESS. However anxiety appeared to increase as recorded on the HADS.

Conclusions: It would appear ODB with Valerian might be a useful treatment for carers who experience sleep disturbance. It might be that such treatment would also benefit patients with an ABI but further research is needed.

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35. Developing and piloting the Wessex Head Injury Matrix 2

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Background and aims: The Wessex Head Injury Matrix (WHIM) (Shiel et al 2000) is a behavioural scale which documents the behavioural pattern of recovery following an acquired brain injury (ABI). While the scale has proved to be very useful it has been becoming increasingly evident that the behavioural ordering of the WHIM requires revision. The aim of this study was to reorder the original scale and pilot the revised version to evaluate if the hierarchical representation could be rendered more robust.

Method: This was a two phase study; the initial retrospective phase, involved the examination of behavioural pattern of recovery for 34 ABI patients as documented on the original WHIM. A co-relational analysis was completed within and between cases. This produced a reordered version of the scale. The behaviours were then weighted in terms of their current diagnostic criteria (Bernat 2009).

The second phase of this research was prospective and observational in nature, whereby the behavioural presentation of two BI patients were recorded using the original and reordered WHIM.

Results: The mean WHIM discrepancy score was 26 using the original scale and 6 using the reordered scale.

Conclusions: The results of this pilot study indicate that the behavioural hierarchical ordering of the original WHIM could be revised. A method for such to be completed has been trialled and piloted, by creating a method for analysis and evaluation, which if replicated on a larger basis could produce a tool with more clinical utility than its predecessor.

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36. "*I think he'd be better off if he had died*": Family and Care Staff Perspectives of Chronic Disorders of Consciousness

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Background and Aims: While conscious awareness may fluctuate in people living with chronic disorders of consciousness, their families and loved ones are fully exposed to a barrage of emotions, responsibilities and ethical dilemmas. Caring for this population group can be extremely challenging with high levels of burnout evident even in professional caregivers, particularly nursing staff (Gosseries, 2012). Understanding the needs of family and care staff is imperative in providing high quality care to people living with disorders of consciousness (DoC). This study examines the experience and needs of people caring for DoC long-term.

Methodology: The main family caregivers of five people with prolonged DoC were interviewed regarding their care experiences. The interviews took place before and after a follow up assessment and intervention period. Families also completed the Family Strain Questionnaire and the State-Trait Anxiety Inventory. Professional care staff involved in the daily care of the person were also interviewed and asked to complete a questionnaire exploring their involvement and attitudes towards the care of chronic vegetative state or minimally conscious state.

Results: Onset of the disorder of consciousness ranged from 6 months – 10 years. All family interviews were highly emotional and exposed the deep need for specialist education. Information regarding what helped and hindered them along their unique care journeys was recorded in addition to a description of “the fight” to obtain services for their loved ones. Professional staff discussed their need for specialist training and their struggle in providing care. The results of the questionnaire provided evidence of levels of strain and anxiety permeating families. Results are also provided on what impact the provision of an assessment and intervention programme had on caregivers.

Conclusions: This research study offers a unique insight into the lived experience of caring for somebody with a disorder of consciousness, from the perspectives of both professional and family carers. Carers of chronic DoC have different needs to carers of those in the acute stage. With growing emphasis on the long term care pathway and re-assessment of these clients this study contributes valuable information on the long-term care of DoC.

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37. What cognitive deficits do reading remediation programs for children with reading delays that arise from a TBI sustained in infancy need to take account of?

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Background and aims: Children with TBI are at increased risk of reading delay (RD). This study aimed to identify what cognitive deficits underlie RD in TBI compared with developmental RD in order to inform remediation strategies.

Method: Children who sustained a TBI in infancy underwent neuropsychological assessment 7-8 yrs following injury. Injury severity varied: uncomplicated mild (UM, n =18) complicated mild (CM, n = 34) & moderate (MOD, n = 18).

Results: Chi square indicated higher frequencies of RD in children with CM TBI and MOD TBI compared with controls (n = 33) (X^2 = 4.4326, p<.05). ANOVA found differences across groups on tests of cognitive function, F (9, 294) = 1.924, pillai’s trace = 1.67, p < .05, partial eta sq = .06. Post Hoc analyses indicated TBI impacted on language skills related to reading acquisition as well as simple and complex attention. Simple and complex attention was correlated with RD in TBI but not in controls. SES, r = .51, p < .05, and time since injury, r = -.43, p < .05, was correlated with RD in MOD TBI.

Conclusion: Deficiencies in language skills were present in controls and TBI with RD. Difficulties with simple and complex attention skills were additionally associated with RD in TBI. This needs to be accounted for in reading remediation programs directed at children with TBI. Deterioration over time in MOD TBI suggests ongoing need for intervention. Impact of SES suggests reading remediation needs to be provided at low cost.

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38. Prevocational rehabilitation in the Czech Republic

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Introduction: Prevocational rehabilitation is performed by members of the rehabilitation team to get a functional assessment of the psychosensomotor potential for employment purposes.

At the Department of Rehabilitation Medicine, First Faculty of Medicine, Charles University, Prague and General University Hospital, prevocational rehabilitation was started under the guidance of Prof. Jan Pfeiffer, MD, already in 1985 at the Rehabilitation Clinic of the 3rd Department of Internal Medicine, First Faculty of Medicine, Charles University, Prague and General University Hospital. This became the first prevocational rehabilitation facility in the Czech Republic.

Methodologies of prevocational rehabilitation: Based on the initiative and methodological guidance of the Department of Rehabilitation Medicine, and in cooperation with the educational company Edost Chomutov, a project was established, which was funded by the European Social Fund and from the state budget of the Czech Republic entitled **"Initiative of the EQUAL Association - Rehabilitation-Activation-Work** (RAW)." This project was conducted from 2005 until 2008. A total of six inpatient rehabilitation departments participated in this project in cooperation with the competent employment agencies. In the Czech Republic, vocational rehabilitation is under the responsibility of the employment (labour) offices in accordance with the Employment Act.

As part of this project, personnel, material and supply standards of rehabilitation departments have been developed for prevocational rehabilitation. We have divided prevocational rehabilitation to the first and second tier methodologies.

First tier methodologies were selected so that they are sufficiently broad and cover most of the work activities. First tier methodologies included tests to evaluate physical exercise, balance, dexterity, orientation in unfamiliar situations, cognitive functions, working position, working equipment, and so on).

The first tier methodologies were: simple, short, time saving (up to 3 hours in a single day), financially and personally less demanding, suitable for clients with mild disability.

Second tier methodologies were used only by selected facilities based on their experience and focus on the age groups of patients with disability or for various functional diagnosis. Second tier methodologies were more variable, more detailed, more time consuming and intended for more complex cases in patients/clients with moderate, severe and very severe disability.

The methodologies used to evaluate the functional psychosensomotor potential will be complemented based on the professional specialization of the facilities, and according to the rehabilitation goals, including retraining or further education and individual possibilities for professional inclusion of the patient/client. Innovative approach in the area of functional assessment is provided by Isernhagen Work System FCE, a functional diagnostics system intended to test the working and functional potential of individuals, which was purchased within the project. This functional diagnostics is intended for people with a disability, without education or with primary education who perform physical work.

The EQUAL project is continued by a **Systemic individual project Regional networks of cooperation in vocational rehabilitation** (PREGNET). The tender was announced by the Ministry of Labour and Social Affairs (MLSA) virtually as a continuation of the RAW project, provided that this project will be spread to the national regions that were not involved in the RAW project, with the objective to create prevocational rehabilitation facilities in each region (the Czech Republic has 13 regions) with standard personnel, material and supply equipment. At the end of the project, we will propose that the MLSA issue accreditations for facilities that will perform prevocational rehabilitation, based on standardization of the prevocational rehabilitation procedures, and the prevocational rehabilitation should be reimbursed from the resources in the employment area. Prevocational rehabilitation centres are currently funded under the Official Journal of the Ministry of Labour and Social Affairs (MLSA), volume 3, 2013 - Price Regulation of the Ministry of Health 1/2014/DZP.

As part of the PREGNET project, standard methodologies for determining the psychosensomotor working potential were divided into basic, recommended and special.

The basic methodology has been selected such that the prevocational rehabilitation centres in the Czech Republic are uniformly equipped and that these methodologies require a one-time investment (financed from the project).

The prevocational rehabilitation centres need not own the recommended methodologies, but if necessary, they should ensure their availability.

Special methodologies are among the optional equipment of the prevocational rehabilitation centres according to their specialization.

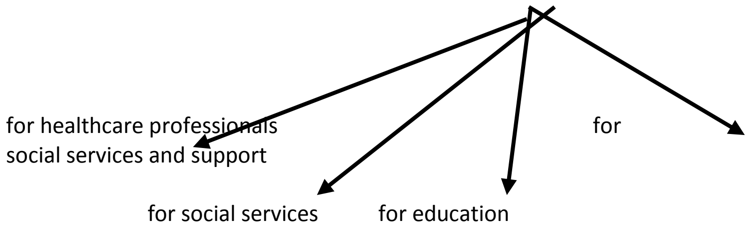
The functional basic methodologies include:

Barthel Index, Instrumental routine daily activities test, Daily structure, Interest questionnaire, Self-assessment of pain, Sensory examination, Work curve by Emil Kraepelin and Richard Pauli, Jebsen-Taylor Test, Purdue-Pegboard test - model 320 20, Jamar Dynamometer, Isernhagen Work System, Loewenstein Occupational Therapy Cognitive Assessment, Activity Matching Ability System, WHO DAS II.

The recommended methodologies include examinations by experts that each facility is obliged to ensure, if necessary, for example, targeted and comprehensive assessment, spiroergometry, speech examination, psychiatric examination, hearing examination, sight examination, etc.

Of special methodologies, we use Functional Independence Measure, Rivermead Behaviour Memory Test, Prevocational assessment according to Jacobs, Canadian model of employment, and General office test.

Conclusion: Medical doctors in prevocational rehabilitation initial/baseline medical examination
prescribing additional functional tests by an inter-professional rehabilitation team
rehabilitation conference
Final report - a summary and assessment of the results obtained by each expert in the team, positive and negative recommendations



for healthcare professionals for
social services and support
for social services for education

We send the final report on prevocational rehabilitation to the respective treating physician.

The final report is also sent to the competent employment offices and as a standard, it is drawn in accordance with the PREGNET project (based on the final report prepared for the employment agencies in the RAW Project) and should not contain any confidential information. This report may contain recommendations for further education or retraining of the patient/client, as retraining falls within the competence of the employment office.

The employment offices follow the conclusions of the prevocational rehabilitation, and recommended vocational rehabilitation, which is focused on particular work activities and particular job positions. If the prevocational rehabilitation facility recommends further long-term education, the special education teacher will contact the appropriate school. Final report is sent to the selected school to the attention of the teacher, who is responsible for teaching people with special needs.

The final report also recommends, on an individual basis, the necessary and appropriate long-term social support (allowances) and services that are processed by the social worker based of functional diagnostics provided by the inter-professional rehabilitation team.

The final reports are processed by a physician, who will summarize the assessments of experts from the inter-professional rehabilitation team, and should include positive recommendations and recommended work restrictions.

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Cognitive Training and the use of cognitive-behavioral techniques in the rehabilitation of visual-spatial deficits

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Background and aims: Many of our daily activities including driving, navigating and writing are reliant on visuospatial skills. Sometimes, however, it can be difficult to identify these difficulties and their impact on everyday life. This study aims to describe the treatment of a 36 year old female (P.A.) with a history of a Developmental Learning Disability and anxiety symptoms.
Method: PA received ten sessions of neuropsychological rehabilitation with these goals: 1. drive to the foodmarket independently. 2. use maps independently to know where she is in shopping-malls. The rehabilitation protocol comprised training strategies described by Shaw (2011) to improve spatial orientation and perception of body schema plus cognitive-behavioral therapy techniques to deal with the patient´s avoidance strategies.
Results: PA's anxiety symptoms impacted on visuospatial functioning. She could learn concepts like north, south, west and east. She could estimate the distance between two objects after measuring it with a ruler and identify right and left on the therapist´s body. These gains made PA feel more confident and lessened the avoidance strategies. After the 6th session she attained goal #1 and after 9th session she attained goals #2.
Conclusions: 1. Anxiety and visuospatial difficulties are amenable to treatment. 2. Anxiety and cognitive training should be treated together 3. PA probably avoided visuospatial challenges because of poor cognitive schema, resulting in less exposure and fewer opportunities to develop this weak area of functioning
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40. Predictors of impaired awareness of deficits early in the rehabilitation process of patients with acquired brain injury

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Background and aims: Many patients with acquired brain injury (ABI) have impaired awareness of deficits. These patients often are less motivated to participate in rehabilitation and have unfavourable treatment outcomes. In this study we searched for predictors of awareness of deficit in the first weeks of clinical rehabilitation.

Method: Participants were patients with ABI admitted for clinical rehabilitation in one of five Dutch rehabilitation centers (De Hoogstraat Utrecht, Tolburg Den Bosch, Adelante Hoensbroek, Reade Amsterdam, Rijndam Rotterdam). Participants completed the Patient Competency Rating Scale (PCRS), Utrecht Scale for Evaluation of Rehabilitation, Utrecht Coping List, Eysenk Personality Questionnaire-RSS, Trail Making Test (TMT), Auditory Verbal Learning Test (AVLT), and fluency tests.

Results: 118 patients participated in this study. At the time of testing, mean length of stay in rehabilitation was 13 days (SD = 10.7 days). Functional independence was significantly associated with awareness of deficit: patients with higher functional independence showed better awareness of deficits (r=-.35, p=.00). Personality also was significantly associated with awareness of deficit: patients who scored high on neuroticism (instability, nervousness, anxiety) were better aware of their deficits (r=-.26, p=.03). Finally, cognitive functioning was significantly associated with awareness of deficit: patients with executive dysfunction and patients with memory dysfunction were less aware of their deficits ($r_{\text{PCRS-TMTb}}$ =-.30, p=.01; $r_{\text{PCRS-fluencyanimal}}$ =-.38, p=.00; $r_{\text{PCRS-fluencyletter}}$ =-.26, p=.03; $r_{\text{PCRS-AVLTimmediaterecall}}$ =-.39, p=.00; $r_{\text{PCRS-AVLTdelayedrecall}}$ =-.27, p=.02).

Conclusion: Early in the rehabilitation process of patients with ABI, level of awareness of deficits is predicted by functional independence, personality, and executive and memory functioning.

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41. Caloric Vestibular Stimulation (CVS) in Low Awareness States

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Background and aims: Individuals in low awareness state (LAS) have sleep/wake cycles but show a reduced awareness of the self and the environment. Existing treatments are often ineffective. Here we assessed whether caloric vestibular stimulation (CVS) might promote recovery from LAS. CVS involves thermal activation of the vestibular organs which, in turn, increases activity within the brain's core arousal structures, notably the reticular activating system, that in the case of LAS are chronically under-activated and the target of other therapeutic interventions.

Method: Four participants, two diagnosed as minimally conscious (MCS) and two as permanent vegetative (PVS) following acquired brain injury, received alternating 4 week blocks (consisting of daily stimulation sessions) of single-blind CVS and sham stimulation for 16 weeks. Behavioural responses were assessed using the Wessex Head Injury Matrix (WHIM) and the JFK Coma Recovery Scale – Revised (CRS-R). EEG and ERP data were acquired every 2 weeks.

Results: All four participants showed behavioural improvement during or after active stimulation: participant 1 (MCS) improved by 8pts on the CRS-R, and by 38pts on the WHIM; participant 2 improved by 1pt on the CRS-R auditory subscale; participant 3 improved by 1pt on the CRS-R arousal subscale; participant 4 improved by 1pt on the CRS-R motor subscale. Some changes were also apparent at the electrophysiological level.

Conclusions: These data provide the first evidence that CVS may promote responsiveness in Low Awareness States. A larger-scale, double-blinded, dose-response study is now needed to more fully assess efficacy and safety.

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42. A multi-model approach to re-capturing identity following right hemisphere stroke

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Background and aims. A right MCA infarct left 39 year old Jon, a London business entrepreneur with a fiancée and a full life, with dense left hemiplegia and cognitive and social communication impairments serious enough to provoke a suicide attempt and extensive psychiatric inpatient treatment. We aim to show that rehabilitation in a therapeutic milieu which focussed on helping Jon to both understand and emotionally tolerate his problems in preparation for engaging with a variety of rehabilitation strategies allowed him to re-capture his identity.

Method Jon attended an 18-week holistic rehabilitation programme. Multiple models were used simultaneously to address inter-related problems of fatigue, executive dysfunction, poor social communication, and mood.

Results We used the Y shaped model to formulate Jon's catastrophic loss of identity and to establish enough safety to allow him to explore his new self. Through the use of compassion focused therapy tools, he tolerated new and different goals. He was able to learn and practice fatigue management, apply strategies to manage executive difficulties and poor time perception, and engage in couples therapy. He regained a sense of control and normality in his everyday life and felt hope for his future.

Conclusions The holistic approach is shown to be effective in dealing with interrelated cognitive and emotional consequences of a devastating stroke at a young age. Jon sent a postcard from his honeymoon to say thanks for making "this wonderful return to the best pleasures of everyday life possible."

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43. Executive functioning, neuropsychiatric symptoms, and quality of life after acquired brain injury

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Background and aims A significant proportion of individuals with acquired brain injury (ABI) experience executive functioning difficulties and neuropsychiatric symptoms post-injury. The most common neuropsychiatric symptoms reported after ABI are anxiety, depression, irritability, aggression, and apathetic symptoms. Even in the long term patients suffer from low quality of life. We aimed to examine the associations among executive functioning, neuropsychiatric symptoms, and quality of life in patients who are referred for inpatient rehabilitation because of prominent neuropsychiatric symptoms.

Method: Data of individuals in the chronic phase after ABI (mean 4.5 years post-injury) with prominent neuropsychiatric symptoms were collected from inpatient clinics of six mental health centers in the Netherlands. Patients completed the Lancashire Quality of Life Profile-short version and the Key Search Test. Therapists completed the Neuropsychiatric Inventory.
Results: Data of 117 patients with ABI were collected. Patients with better executive functioning showed less neuropsychiatric symptoms ($\beta = -.21$, $p < .05$). Total neuropsychiatric symptoms were not associated with quality of life ($p > .05$). However, apathy was negatively associated with quality of life ($\beta = -.26$, $p < .05$). There were no significant associations between executive functioning and quality of life ($p > .05$).
Conclusion: Executive dysfunction predicts high levels of neuropsychiatric symptoms. Of the neuropsychiatric symptoms, only apathy predicts low quality of life.
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44. The motor function improvement of the effected hand after stroke induced by music-supported therapy: a functional magnetic resonance imaging study

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Background: Motor disabilities after stroke have been the target of several recently-developed therapies, but the motor function of the affected hand is less focused on.
Aims: This study aimed at assessing the motor recovery of the effected hand and neural reorganization induced by music-supported therapy in stroke patients.
Methods: 14 patients with subcortical stroke, mild to moderately impaired hand function fulfilling the inclusion criteria were randomly assigned to the music group (MG) or control group (CG).Both groups received keyboard (Yamaha) training for 30min, 20 times over 4 weeks in addition to conventional treatments, and CGs' keyboard could not make any sound. Patients were assessed by Wolf Motor Function Test (WMFT) and 1.5-Tesla functional magnetic resonance imaging (fMRI) before and after training. Brain functional mapping was acquired with Statistical Parametric Mapping (SPM) 5, and different activations of brain were compared between the two groups.
Results: The increment of WMFT scores in MG were significantly better than the CG. The fMRI of active thumb palmar opposition movement of the affected hand showed activation in contralateral Primary Sensorimotor Cortex (SMC), Premotor Cortex, bilateral Supplementary Motor Area and ipsilateral cerebellum when the affected hand moved. Lateral index and Z value of SMC increased in both groups, and the increment in MG was much more significant compared with CG. There was positive correlation between LI (SMC) and WMFT improvements.
Conclusions: The restoration of hand function after stroke was associated with brain functional reorganization. The music-supported therapy could lead to neural reorganization better than the training with no sound in which the music played an important role.
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INVITATION TO AUSTRALIA

As convenor of the 12th Neuropsychological Rehabilitation Conference in 2015 I want to invite you to beautiful Daydream Island on the Whitsundays in Australia on 6th and 7th July 2015. Margaret will have the call for abstracts out soon so put the dates in your diary and join us in Australia for the NR-SIG-WFNR conference. There are so many things to do whilst you are there - swim in the wonderfully warn blue waters off Daydream Island, take a boat ride around the Great Barrier Reef, go snorkelling or even take a trip to the rainforest in Cairns. Registration costs will be the same as this year and accommodation with breakfast starts at AU$150 for 2. Bring the family and have a holiday at the same time. The INS/ASSBI conference will be held in Sydney immediately prior to our conference and it's easy to get to Daydream Island from there. So even more reason to visit Australia and make a long break of it. See you on Daydream Island.

Catherine Haslam, Convenor